Handbook of TERROR MANAGEMENT THEORY

Edited by
Clay Routledge
Matthew Vess



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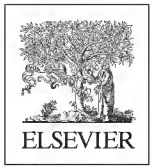
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Preface

Philosophers and theologians have long pondered the human existential condition. What does it mean to be human, a being that is intellectually unique from other animals but ultimately burdened with the same physical vulnerabilities and destined to the same mortal fate? In the 20th century, psychologists, sociologists, and anthropologists entered the fray, speculating how the human quest to be more than a mortal animal pervades intrapsychic processes and broader social and cultural structures. Most of these approaches, though diverse and intellectually rich, were purely theoretical. This changed in the mid-1980s, however, when three social psychologists (Greenberg, Pyszczynski, & Solomon, 1986) used their training in experimental methods to develop and test what was to become a highly influential account of human social behavior: terror management theory (TMT).

Fast-forward 30 years and TMT has become one of the most prominent theories in social psychology. It has generated hundreds of published empirical papers and chapters. It has been prominently featured in the media, was the focus of the award winning documentary, *Flight from Death*, and is the subject of the trade book *The Worm at the Core,* just published by Random House. It is, in many respects, a theory with wide appeal and application.

So what is TMT about? The theory is based on the writing of existential scholars, most notably cultural anthropologist Ernest Becker, who won the Pulitzer Prize in nonfiction for his 1973 book *The Denial of Death.* Becker proposed that many complex human behaviors are fundamentally driven by the need to attenuate anxieties about personal mortality. He noted that, because humans strive to survive but possess the requisite intelligence to understand the inevitability of death, they construct and invest in cultural structures that serve to symbolically or literally provide perceptions of self-transcendence—a feeling that people have an essence or identity that does not die with the physical body.

Becker's theorizing offered a unique and powerful analysis of human cultural life, but it lacked empirical evidence. Many thought his ideas were untestable, that they were more philosophical than scientific. The formalization of TMT addressed these limitations. The theory reintroduced and expanded upon the ideas of Becker in social psychological terms and, most importantly, specified testable hypotheses. The original theory was published in 1986 and empirical support for the theory followed quickly. During the

1990s, interest in TMT grew dramatically and hundreds of empirical studies were published testing novel hypotheses derived from the theory. This large foundation of support, in turn, inspired an even greater and more widespread interest in the theory. Now, researchers across many disciplines representing laboratories all over the world are conducting research through the lens of TMT and offering important conceptual extensions, refinements, and applications. The theory and research based on it have also inspired other theoretical approaches to studying humans as existentially troubled animals.

The primary reason for TMT's profound influence is the simple fact that the awareness of self and death impact a wide range of phenomena. Indeed, the knowledge of mortality and the human response to this knowledge impacts mental health, physical health, human sexuality, romantic relationships, parenting, goals and aspirations, social and cultural identities, and intergroup relations. TMT has been used as a theoretical lens to answer critical questions such as: Why are people religious and nationalistic? What makes people willing to hurt others and themselves in the service of ideology? Why is self-esteem such a powerful motive? Why do people go to such great lengths to deny their biological nature, to distance themselves from other animals? Why do people engage in behaviors that clearly threaten their physical health? How can we explain judgmental biases in legal contexts? Why do people strive to acquire wealth and become heavily influenced by the media?

This handbook offers readers a representative overview of TMT. It provides insights into the critical research derived from the theory, challenges to the theory, recent research that has expanded and refined the theory, the many ways that the theory has been utilized to understand domains of human social life, and the many practical applications of the theory.

The book is divided into three sections. The first section introduces the theory in detail, considers related theoretical perspectives that offer alternative or complementary accounts of phenomena that has been the subject of TMT research, and offers a helpful toolkit and procedural walkthrough for conducting research using TMT-based experimental paradigms.

The second section focuses on the diverse range of intrapsychic, social, and cultural phenomena that TMT has helped elucidate. This includes how people understand their social and cultural world at a basic cognitive level (e.g., the desire for structure and order) and at the more complex attitudinal (e.g., attitudes about nature, sex, and the connection between humans and animals) and ideological levels (e.g., religious and secular belief systems). Critically, it also includes the processes and motives that constitute the self-system (e.g., self-schemata, self-esteem, self-referent nostalgic memories) and the individual differences that shape the self (e.g., attachment style, neuroticism, need for structure). This section further includes chapters considering how TMT-related processes influence the different facets of psychological well-being and growth-oriented states and goals. The second

section closes with an introduction to emerging and exciting research using the tools of neuroscience to study how people grapple with existential concerns and questions about death.

The third and final section focuses on applications of TMT. Once researchers began to understand just how influential existential motives are in the lives of humans, they sought to use TMT as a tool to understand specific and important personal and societal issues. This section offers an introduction to just some of the many applications of the theory, including applications to physical and mental health, the legal system, war and terrorism, art and media, consumerism, and communication.

This handbook is in no way an exhaustive volume cataloguing every important TMT-related research discovery. It does offer, however, in a single place, a critical overview of how TMT is used, where it has been, and where it is heading. We envisioned this book as a resource that would be accessible and useful to people who know very little about the theory, to instructors who are interested in developing a course on the theory, to researchers who are trying to begin utilizing the theory in their research, and to experts who have extensive experience working with the theory but may be unaware of all of the areas it has been explored. The many gracious contributors to this volume have helped make that vision a reality. In many ways, the broad expertise of the contributors, ranging from experts in marketing and legal decision making to basic social psychologists, is a testament to the wide appeal and impact of the theory itself. We are incredibly grateful to our authors for providing such incredibly strong, interesting, and accurate chapters. We learned more about the theory as a result of editing this book. And, any success of the book belongs, first and foremost, to the authors whose work created it.

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Chapter 1

A Consideration of Three Critical Hypotheses

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INTRODUCTION

In his lectures and writings on theory evaluation, Kuhn (1977) identified several criteria scientists should consider when choosing among theories that compete to explain the same phenomena. One of the criterions he discussed was termed, fruitfulness. According to Kuhn, "a theory should be fruitful of new research findings: It should, that is, disclose new phenomena or previously unnoted relationships among those already known." On this standard, terror management theory (TMT) fares quite well. Since it was introduced in 1986, TMT has led to a number of novel findings concerning the psychological function of self-esteem and cultural worldviews. These discoveries have come from hundreds of studies conducted over the last three decades testing TMT's three key hypotheses: (1) the mortality salience (MS) hypothesis, (2) the death-thought accessibility (DTA) hypothesis, and (3) the anxiety-buffer hypothesis. In the pages that follow, we review the various studies supporting each of the three hypotheses, with an eye toward some of the particularly novel, counterintuitive findings that have been revealed. Following this review, we use TMT's three key hypotheses to generate a series of testable predictions about the role of immortality in people's defense of the cultural worldview and pursuit of self-esteem. To date, only a handful of studies have directly examined immortality as a terror management motive, which is somewhat surprising given that a desire for death-transcendence is a core component of the theory. We begin with a brief overview of TMT.

TERROR MANAGEMENT THEORY

Building on the work of the late cultural anthropologist, Becker (1962/1971, 1973, 1975), TMT posits that a key difference between *Homo sapiens*

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sapiens and other organisms is the size and complexity of the brain. This evolved complexity afforded humans the intellectual capacity to be aware of their own existence and of the passage of time. These intellectual proclivities, among others such as language, provided humans with a number of survival advantages in terms of anticipating future outcomes, planning, cooperating, and overcoming environmental challenges. Yet, these advanced abilities also came with a downside: the capacity to ponder one's own existence combined with the ability to think about the future made humans aware of their inevitable death. TMT asserts that the knowledge of one's own mortality is problematic because it conflicts with a basic drive to stay alive that humans share with all other living organisms. Knowing that one is destined to die, coupled with a drive for continued life, thus creates a potential for existential terror that other animals likely do not possess.

The Role of Cultural Worldviews and Self-Esteem

According to TMT, if people were to experience existential terror unabated it would interfere with many effective forms of thought and behavior (see Chapter 19, this volume). Thus, humans developed a defensive psychological system geared to keeping thoughts and concerns about death away from consciousness so as to limit the potential for debilitating death anxiety. The primary way humans manage the fear of death is through large-scale cultural belief systems (i.e., cultural worldviews) and self-esteem. *Cultural worldviews* are humanly constructed, shared, symbolic conceptions of reality that infuse human existence with a sense of meaning, order, and permanence. *Self-esteem* is the general sense that one is heroic within the context of the cultural meaning system. Thus, people acquire self-esteem by living up to specific contingencies of value that are prescribed by the culture but that are integrated into a unique, individualized version of the worldview by each person.

This analysis suggests that there should be considerable variability, across cultures and individuals, in the particular contingencies of worth the individual pursues in order to feel heroic. Ultimately, maintaining faith in a cultural worldview and self-esteem functions to alleviate the fear of inevitable death by providing individuals with a sense of death-transcendence, or immortality, which can be literal or symbolic. Literal immortality refers to the belief in some form of an afterlife. Symbolic immortality refers to symbolic extensions of the self (e.g., the family lineage, works of art, or written works) that persist within the culture after one's physical death. From this view, self-esteem is the sense that one is on a path to achieving death-transcendence by living up to the particular standards of value prescribed by the culture.

Development of the Self-Esteem Motive

Another important component of TMT is its analysis of how the two psychological structures, cultural worldviews and self-esteem, obtain their anxiety-buffering properties over the course of child development. This analysis draws from John Bowlby's work on the attachment bond observed among mammals and especially primates. Before human infants have the cognitive capacity to understand their mortality, they nevertheless experience innate fear in response to anything that could end their existence (strangers, the dark, ferocious animals) and prolonged separation from attachment figures. This experience of fear is unpleasant and thus motivates the infant to seek close proximity to attachment figures, which alleviates the fear. Thus, early on in development, fear is reduced through close, soothing contact with attachment figures (e.g., parents). However, later in development, parents begin to place expectations on the child to act in certain ways. When the child goes against these expectations, parents may express disapproval, withdraw signs of affection, or dispense punishment. Similarly, when the child is successful in meeting parental expectations, parents may express approval and offer affectionate praise.

These experiences compose the early stages of the socialization process in which the child learns that being "bad" and breaking parental standards leads to a feeling of vulnerability and heightened fear, whereas being "good" and meeting parental standards leads to safety and the abatement of fear. This progression from attachment to socialization, in which the child internalizes and follows parental standards of value to maintain emotional closeness to parental figures, denotes the emergence of self-esteem as a symbolic, standard-based psychological structure that functions to manage the child's basic fears and anxieties. Thus, the self-esteem system for managing fear develops on the heels of the earlier attachment mechanism.

Later in development, with increasing cognitive complexity, children develop a mature understanding of death as biological, universal, and inevitable. At the same time, the child is also coming to the realization that once-seemingly omnipotent parents are, in fact, fallible and mortal and thus incapable of protecting him or her from the ultimate threat of inevitable death. These budding realizations are thought to trigger the child's need for a broader source of security beyond that provided by parents. Children begin to internalize and live up to the ideals and teachings of the cultural worldview; that is, they strive to attain culturally valued occupations, roles, statuses, relationships, group identifications, and achievements. This transition from parents as a secure base to the cultural worldview is usually seamless because parents and other important caregivers serve as agents of the culture. Moreover, the final shift to investment in the cultural meaning system allows for the broadest form of security, one capable of providing death-transcendence.

EMPIRICAL SUPPORT

The Mortality Salience Hypothesis

One of the central predictions made by TMT is that reminders of death should increase people's motivation to uphold cultural worldview beliefs and pursue self-esteem. In other words, if cultural worldviews and self-esteem function to reduce concerns about death, then reminding people of death should increase their need for these protective psychological structures. The lion's share of research in support of TMT has tested variants of this hypothesis, commonly referred to as the *mortality salience (MS) hypothesis*. These studies show that briefly reminding individuals of their mortality causes them to exhibit higher levels of worldview defense and to pursue activities that have the potential to increase their self-esteem. Support for the MS hypothesis has been obtained cross-culturally, that is, reminders of death have produced effects on worldview defense and self-esteem striving in both Western (United States, Canada, Italy, Germany, and Israel) and non-Western cultures (e.g., Japan, Iran, China, and India). Moreover, substantial bodies of evidence have found these effects to be specific to heightened accessibility of death-related thought and different from the effects of thinking of other aversive topics (e.g., uncertainty, social exclusion, intense physical pain, or a looming exam).

Mortality Salience Increases Defense of the Cultural Worldview

Worldview defense has been operationalized in many different ways. The most common is to ask research participants to evaluate an individual who supports (vs opposes) the participant's worldview or who belongs to a similar (vs different) culture or group. More favorability toward the worldview supporter (vs detractor) is considered an indication of worldview defense. Another common method of assessing worldview defense is to ask participants to provide an evaluation of or assign a punishment to a person who has violated cultural standards of value, such as a lawbreaker or moral transgressor. A harsh evaluation or more severe punishment toward such individuals is thought to represent increased worldview defense. In other studies, worldview defense has been measured as more favorable evaluations of people and ideas that support the cultural worldview.

One of the first studies testing the MS hypothesis was done with municipal court judges in the city of Tucson, Arizona, and assessed worldview defense as punishment toward a lawbreaker. In this study, Rosenblatt, Greenberg, Solomon, Pyszczynski, and Lyon (1989) had judges review a case brief for a prostitution charge and suggest a bond amount for the accused after writing about their own death (vs not). If upholding the law is a central component of a judge's worldview, then, per the MS hypothesis, judges who were reminded of their own death should defend their worldview

by reacting more harshly toward those that break the law through suggesting a higher bond amount for the accused than those not reminded of their own death. The results supported this prediction. Judges in the MS condition suggested an average bond of $455, whereas the control judges suggested an average bond of only $50. In a second study, Rosenblatt et al. (1989) replicated this effect among university students, but MS only increased bail allocation among those who indicated in an earlier session that they disapproved of prostitution (i.e., those for whom prostitution represented a violation of their worldview). A third study assessed whether MS would increase affinity for a cultural hero. In this study, participants were reminded of their mortality (vs not), read a news story about a woman who gave police information that led to the arrest of a serial mugger, and then recommended a reward for the woman. Participants reminded of their own death suggested a larger reward for the heroine than those in the control condition.

Defending one's worldview is not limited to reactions toward individuals or groups that champion or impugn that worldview, but may also occur through the protection of symbols that embody one's culture. In a clever study testing this idea, Greenberg, Porteus, Simon, Pyszczynski, and Solomon (1995) had American participants write about their own death or a control topic and then complete two different problem-solving tasks. Participants were given various objects to help them complete these tasks, but the most efficient methods were to use specific objects in ways that would damage them. Greenberg et al. (1995) found that when these objects were culturally valued symbols (i.e., an American flag and a crucifix), reminding participants of their own death (vs control) made them more reluctant to use the American flag or the crucifix for fear of damaging them, and, as a result, made them significantly slower at solving the puzzles.

Mortality Salience Motivates Prejudice and Aggression

According to TMT, people need to maintain faith in a cultural worldview because doing so serves the vital psychological function of managing existential terror. The problem, however, is that cultural worldviews are largely subjective accounts of the nature of reality. Because they contain many subjective elements, worldviews are inherently fragile and require continual social validation to seem real and true. This problem becomes magnified when we encounter people with beliefs that are very different from our own. Still more problematic is that these different others often show the same happiness and steadfast conviction in their beliefs as we do in ours—so much so that some of them are willing to fight and die for what they believe. As such, the existence of people with different worldviews implies that our conception of reality and claims to death-transcendence might be no more real than a fairy tale or a video game plotline.

Under nonthreatening conditions people can certainly tolerate and even appreciate other cultures, groups, and value systems. However, TMT predicts that when existential threat is high and there is strong motivation to uphold faith in the cultural worldview, people should react with more prejudice and hostility toward members of opposing cultures and groups. Some of the earliest studies testing the MS hypothesis support this analysis. For example, Greenberg et al. (1990) found that reminding Christian participants of their own death increased their liking of a fellow Christian, but decreased their liking for a Jewish student. An additional study conceptually replicated this effect with a nationalistic worldview. Greenberg et al. (1990, Study 3) found that American participants who were reminded of their own death reported more liking of an interviewee who spoke positively about the U.S. political system and reported less liking for an interviewee who spoke negatively about the U.S. political system. To see if these results would generalize to racial prejudice, Greenberg, Schimel, Martens, Solomon, and Pyszczynski (2001, Studies 1–2) assessed White participants' attitudes toward either a White man or a Black man that expressed pride in his racial group. Under nonthreatening control conditions, the participants liked the Black man more and judged him as less racist for expressing pride in his group. However, under MS this preference completely reversed: White participants showed more liking for the White man and judged him as less racist for expressing White pride. In a third study, Greenberg et al. (2001) replicated this pattern on a measure of racial discrimination. White participants were reminded of death or dental pain, and then read a legal description of a case brief in which a Black employer or a White employer was found guilty of discriminatory hiring practices. In the case summary, the Black employer was quoted as justifying his discrimination based on the need to combat White privilege, whereas the White employer justified his discrimination based on the need to combat reverse discrimination. After reading the case, participants indicated the extent to which they thought the employer was guilty of discrimination. In the control condition, White participants had more sympathy for the Black racist employer, and assigned more guilt to the White employer. Conversely, after being reminded of death, White participants had more sympathy for the White racist, and assigned more guilt to the Black employer.

Another disturbing implication of a TMT analysis of human social behavior is that reminders of death might increase actual aggression against worldview violators. Influenced by news reports of hot sauce being a way to abuse or assault others, McGregor et al. (1998) developed a laboratory paradigm for measuring aggression as the allotment of super spicy hot sauce for another participant to consume as part of a supposed "taste test." In this series of studies, participants were reminded of death or a control topic and then chose an amount of hot sauce for another participant to drink who they were led to believe had a strong dislike for spicy foods. Across three studies, McGregor et al. (1998) found that MS led participants to assign more hot

sauce to the other participant if they thought the person had an opposing (vs supporting) political worldview. Importantly, in a fourth study, McGregor et al. (1998) found that participants tended to assign more hot sauce to another person that had previously assigned them to drink a noxious tasting juice, which is consistent with prior work on aggression. However, placing participants under MS did not exacerbate this retaliatory aggression, indicating that the MS effect on aggression was specific to people with a threatening worldview.

Even more chilling are studies assessing whether MS would increase support for large-scale aggression against groups that are currently in conflict across the globe. Pyszczynski et al. (2006) found that MS increased Iranian participants' support for violence against Americans through a more positive evaluation of a pro-martyrdom student and increased willingness to consider joining the pro-martyrdom student's cause. In a subsequent study, Pyszczynski et al. (2006) found a parallel effect among Americans, with MS increasing their support for extreme military actions (e.g., use of nuclear weaponry and preemptive strikes) against worldview threatening nations (e.g., Iran, North Korea, and Syria). More shocking is that Americans reminded of their own death also said they were willing to sacrifice thousands of civilian lives if it led to the capture or killing of Osama bin Laden. Along similar lines, Hirschberger et al. (2016) found that when reminded of death, Israeli Jewish and South Korean participants were more supportive of retributive violence against Hamas and North Korea, respectively, when such acts were justified. In summary, MS can lead to the acceptance and support for violent intergroup conflict, even if it ends with mass civilian casualties.

Mortality Salience Can Inspire Socially Constructive Behaviors

Thus far, most of the research we have reviewed paints a fairly negative picture of the human need to manage concerns about death. However, death reminders need not always lead to ethnocentrism, intergroup conflict, and punishment of moral offenders. Reminders of death can also lead to socially constructive responses (see Vail et al., 2012 for a review). Because cultural worldviews prescribe standards of universalism and benevolence, the theory also predicts that when prosocial values are particularly salient, or if people derive meaning and personal value from being prosocial, terror management can take a compassionate form. In the first study to examine this possibility, Greenberg, Simon, Pyszczynski, Solomon, and Chatel (1992) found that MS (vs control) led politically conservative students to show more liking for a fellow conservative student compared to a politically liberal student. However, for politically liberal students, who tend to value tolerance and social justice, MS (vs control) reduced their bias toward liking a fellow liberal (vs conservative) student. In a second study, Greenberg, Simon et al. (1992) found that MS led American participants to show a strong

pro-America bias, but priming the value of tolerance in combination with MS, significantly reduced this tendency. Building on this research, Jonas et al. (2008) tested the hypothesis that whether MS leads to socially constructive or socially destructive behaviors depends on the specific cultural norms and values that are salient. For example, Jonas et al. (2008, Study 1) found that MS led to more (vs less) willingness to help needy children when prosocial (vs pro-self) values were primed. In another study, Jonas et al. (2008) found that priming the conservative value of needing safety and security led mortality salient participants to punish a prostitute more harshly, whereas priming the value of benevolence and universalism reduced this effect of MS.

Given the many studies showing that MS leads people to express hostilities toward outgroups, an important question is whether MS can actually increase compassion toward outgroup members if people value being kind and compassionate. Schimel, Wohl, and Williams (2006) reasoned that people high in trait empathy, because they tend to spontaneously experience empathic emotions in response to the needy, are more likely to act on these emotions, and be rewarded for showing kindness. If so, then over time these individuals should come to predicate their self-worth on living up to prosocial values. If people base their self-worth on being prosocial, reminders of death should increase their motivation to uphold these values. To assess this possibility, Schimel et al. (2006, Study 2) had participants read a sports article in which an outgroup member intentionally injures an ingroup member, or a parallel article in which an ingroup member intentionally injures an outgroup member. Next, the participants were asked how much they would be willing to forgive the person that caused the injury. If the participants were mortality salient and had low-trait empathy, they were less forgiving of the outgroup member and more forgiving of the ingroup member. However, if the participants were mortality salient and high in trait empathy, they were more forgiving of the ingroup and the outgroup member. Gailliot, Stillman, Schmeichel, Maner, and Plant (2008, Study 1) found a conceptually similar pattern of results by priming a prosocial value. Specifically, when non-Black participants were primed with death and the value of egalitarianism, they showed a significant decrease in prejudice toward Black people. Together these studies converge on the idea that MS can motivate anti-prejudice and kindness toward others among people who derive meaning and self-worth from living up to prosocial values.

Mortality Salience Increases Striving for Self-Esteem

Cultural worldviews prescribe standards for self-esteem that people pursue to achieve a sense of significance, or symbolic immortality. According to the MS hypothesis, if living up to cultural standards serves a terror management function, then reminding people of death should increase their desire to meet these standards. In other words, MS should inspire people to strive for

self-esteem. One standard for self-esteem that exists in many cultures across the globe is to acquire wealth and social status. Kasser and Sheldon (2000) therefore assessed whether reminders of death would increase people's desire for money and power. They found that reminding participants of their mortality (vs music) led them to make higher estimates of having personal financial success 15 years into the future, and caused them to behave more selfishly (i.e., greedy) in a forest management game. Along similar lines, Mandel and Heine (1999) found that a death reminder increased participants' desire for high status products (e.g., a Lexus automobile and a Rolex watch), but not low status products (e.g., a Geo automobile and a can of Pringles chips), and this pattern was replicated among Japanese participants by Heine, Harihara, and Niiya (2002).

In addition to the broad standards of gaining wealth and status, there are other more specific contingencies of worth that people can pursue to earn a sense of meaning and personal value. Indeed, people might base their self-esteem on being physically attractive, a loyal friend, humorous, athletic, smart, artistic, and so on. Positive contributions in any of these domains afford people a sense of self-worth and should therefore serve a terror management function. For example, Peters, Greenberg, Williams, and Schneider (2005) found that reminding people of death led them to squeeze a hand-dynometer harder to show off their strength, but only for people who indicated in a prescreening session that their self-esteem was contingent on being physically strong. In related studies, MS has been found to increase physical fitness intentions among people who value being physically fit (Arndt, Schimel, & Goldenberg, 2003) and to heighten concern for the environment among people who derive their self-esteem from pro-environmental action (Vess & Arndt, 2008). Studies have found similar effects when specific norms or standards for self-esteem are made salient. For example, across three studies Fritsche, Jonas, Niesta Kayser, and Koranyi (2010) found that when pro-environmental norms were made salient, a reminder of death increased liking of an advertisement for a fuel-efficient car (Study 1), sustainable behavior in a forest management game (Study 2), and choosing a reusable (vs disposable) cup when offered a cup of coffee (Study 3). Following the same logic, Gailliot et al. (2008) found that reminding people of their mortality while priming the cultural standard of helping increased participants' intentions to help others, and actual helping of a confederate that dropped her folder and some papers.

Mortality Salience Can Cause Paradoxical Behaviors

Interestingly, some of the studies investigating self-esteem motives in response to MS demonstrate a paradoxical effect. We refer to these effects as paradoxical because they show how priming death can cause people to pursue self-esteem in ways that increases their vulnerability to death.

A rational response to being reminded of death would be to shun behaviors associated with a higher risk of mortality, such as smoking, tanning, and reckless driving. However, TMT's dual process model predicts that under specific conditions (see Chapter 2, this volume), MS causes people to pursue the abstract goal of attaining symbolic, death-transcendent value, even when doing so exposes them to the risk of actual death. For example, Taubman-Ben-Ari et al. (1999) found that among people who base their self-worth on driving acuity, MS led them to drive faster and more recklessly on a driving simulator presumably to show off their driving skill. Of course, driving recklessly in the real world puts one at risk of a driving fatality. Similarly, Routledge, Arndt, and Goldenberg (2004) found that when participants were primed to associate tanned skin with physical attractiveness, MS led them to show more interest in tanning, a behavior that increases their risk of getting skin cancer (see also, Cox et al., 2009). Also demonstrating this paradoxical behavior are studies showing that reminders of mortality lead religious fundamentalists to endorse the power of prayer over medical attention, which increases their risk of dying from treatable diseases (Vess, Arndt, Cox, Routledge, & Goldenberg, 2009). Of course, a chilling real-world example of this kind of paradoxical behavior is suicidal martyrdom in which the martyr willingly dies in order to achieve a sense of literal or symbolic immortality. Consistent with this analysis, Routledge and Arndt (2008) found that after being reminded of their own death (vs pain), British participants said they would be more willing to die for England, unless another avenue for achieving symbolic immortality was salient to them.

The Death-Thought Accessibility Hypothesis

A second, central prediction made by TMT is called the *death-thought accessibility (DTA) hypothesis*. It is the converse of the MS hypothesis and is stated as follows: If cultural worldviews and self-esteem function to buffer individuals from thoughts and concerns about death, then threatening or weakening these psychological structures should increase the accessibility of death-thoughts. DTA is typically measured using a word-fragment completion task in which participants are presented with a list of 20–25 word fragments and are asked to complete each fragment in succession with the first word that comes to mind (see Webber, Zhang, Schimel, & Blatter, 2015). Some words in the list are designed to be completed as a death-related word or a nondeath-related word. For example, the fragment, "S K _ L L" could be completed as "SKULL" or "SKILL." The more death words people complete, the more it can be inferred that death-thoughts are close to consciousness. Another way of measuring implicit death-thoughts is through a lexical decision task in which participants are shown a string of letters on a computer screen. They are instructed to indicate, as quickly as possible, whether each string of letters forms a word or a nonword. The faster they

respond to death-related words, the more it can be inferred that the concept of death is accessible. These measures have been used in numerous studies showing that DTA is temporarily increased following threats to (1) the cultural worldview, (2) people's bases for self-esteem, (3) significant relationships, (4) the human–animal boundary, and (5) structured meaning.

Cultural Worldview Threats

According to TMT, cultural worldviews promote psychological equanimity in the face of death by offering a means through which individuals can achieve death-transcendence. The feeling of being part of something larger than oneself—something important and enduring—can provide a sense that life is meaningful, and thereby reduce concerns about death. But when the importance or value of the cultural worldview is called into question, its ability to keep death-thoughts under wraps can become compromised.

We tested this idea in a series of studies that examined the effect of worldview threat on DTA (Schimel, Hayes, Williams, & Jahrig, 2007). In four studies, we sampled among Canadian participants who reported being proud of their Canadian identity. We reasoned that, for proud Canadians, Canadian values must make up a significant part of their personalized worldview. Once in the lab, we threatened this worldview by randomly assigning participants to view a webpage that belittled an array of Canadian cultural values and achievements (e.g., diet, love of hockey, universal healthcare). In the control condition, participants viewed a parallel webpage that derogated Australian culture. The results consistently showed higher levels of DTA in the anti-Canada (worldview threat) condition compared to the anti-Australia (control) condition. These results were not due to an overall increase in negative thoughts (Study 3) or anger (Study 4), but appeared to be specifically due to the worldview threatening nature of the webpage. Indeed, Study 2 showed that when participants were given information about the author that made him appear foolish—and thus provided a ready-made means of diffusing the threat—the DTA-arousing effect of reading the anti-Canada material was eliminated. Moreover, Study 4 showed that it was the feeling of being personally offended or offended as a Canadian (i.e., the extent to which their worldview was threatened) that was responsible for the increase in DTA.

Additional studies have provided evidence for the generalizability of the effect. From a TMT perspective, all worldviews function to manage death concerns. Thus, threatening the validity of any system of beliefs should increase DTA among people who espouse those beliefs. Consistent with this idea, Schimel et al. (2007; Study 5) found that reading an anticreationist essay that presented evidence in favor of macroevolutionary processes increased DTA among creationist participants, but not among evolutionist participants. Similarly, Friedman and Rholes (2008) found that highlighting inconsistencies within the Bible increased DTA among Christian fundamentalists, who believe

that the document represents the infallible word of God. Further documenting this effect among Christians, Webber, Schimel, et al. (2015) found that having Christian participants read an article informing them that the story of Jesus was borrowed from the religious lore of previous cultures dating back over 1000 years increased Christian participants' DTA. Although it may be easy to see how religious worldviews help to manage death concern (e.g., beliefs regarding heaven and the afterlife), according to TMT, threatening nonreligious—even atheist—worldviews should also increase DTA. In support of this idea, Hayes et al. (2015; Study 1) found that threatening the viability of a scientific explanation of the origins of life (i.e., evolution) increased DTA among a sample of atheists. Thus, DTA will become aroused following threats to any worldview, because these beliefs function to shield the individual from concerns about death.

Research using the DTA hypothesis has also demonstrated the role of DTA in the production of defense following worldview threat. From the perspective of TMT, DTA represents a key motivational mechanism in worldview defense following threat. In other words, potent threats to the worldview increase DTA, which in turn promotes worldview defenses that function to reduce DTA. Several studies support this mechanistic account. First, Hayes et al. (2015) found that threat-induced DTA mediated the effect of threat on two distinct types of worldview defense: derogation and accommodation. Whereas derogation involves disparaging the source of the threat as a means of defensively retaining the status quo, accommodation entails modifying less important, peripheral worldview beliefs to accord with the threat. The latter defense serves to reduce the inconsistency between one's preexisting beliefs and those initially deemed threatening, and thereby eliminates the threat in a relatively nonconfrontational manner. Subsequent studies showed that people low in self-esteem often prefer defending via accommodating relative to derogation. Nevertheless, when accommodation is restricted to peripheral worldview beliefs—and does not entail change to core beliefs—it represents an effective means of reducing threat-induced DTA (Hayes et al., 2015; Study 5).

When neither derogation nor accommodation appear viable for defending one's worldview against threat, however, TMT maintains that people may become motivated to engage more extreme forms of defense. One such option, termed annihilation, involves killing or mobilizing group-based efforts to destroy the threatening enemy. In keeping with the DTA hypothesis, if the death of worldview violators functions to defend the worldview against their threatening violations, then DTA should be reduced relative to when the violators are still alive. Evidence for this idea comes from a study where we exposed Christian participants to a worldview threat article depicting the rise of Islam (vs a neutral control condition). We included a third condition in which participants were exposed to the threat condition, but at the end of the article, they were given additional information regarding a

plane crash that killed more than a hundred Muslims (Hayes, Schimel, & Williams, 2008). Results showed that although the threat article increased DTA relative to control, the annihilation information served to eliminate the threat, and DTA therefore remained low. Taken together, these studies provide strong support for the motivational primacy of death-thoughts in the dynamics of threat and defense.

Self-Esteem Threats

TMT maintains that in addition to the cultural worldview, self-esteem, the belief that one is a valued member of the culture, is a major component of the anxiety-buffering system as well. Thus, threatening people's self-esteem should increase DTA. Several studies support this prediction. For instance, Ogilvie, Cohen, and Solomon (2008) found increased DTA among participants asked to reflect upon undesired (vs desired) aspects of themselves. Thinking about undesirable aspects of ourselves—such as a time in which we failed to live up to our personal standards—poses a threat to our overall self-image, and thus hampers our ability to keep death-thoughts at bay. Similarly, Hayes, Schimel, Faucher, and Williams (2008) threatened self-esteem by exposing participants to simulated failure experiences. In one study, participants who believed they had above average intelligence were given false failure feedback after taking an IQ test. In another study, participants were told that their personality made them ill-suited for their desired career. A third study created a situation in which participants were set up to believe that they would have to give an ill-prepared speech in front of their peers—a situation that would certainly lead to failure and embarrassment. Across the board, these manipulations increased DTA relative to no-threat controls.

Relationship Threats

Although original statements of TMT conceptualize the anxiety buffer in terms of worldviews and self-esteem, some researchers have proposed a tripartite buffering mechanism that also includes close relationships (Hart, Shaver, & Goldenberg, 2005; Mikulincer, Florian, & Hirschberger, 2003). According to this perspective, close personal bonds can lend meaning to life and manage existential anxiety even in the absence of worldview validation or self-esteem enhancement. In support of the existential function of close relationships, Mikulincer et al. have found that threats to close relationships will also increase DTA. In one study, participants imagined separation from a close relationship partner (Mikulincer, Florian, Birnbaum, & Malishkevich, 2002). This manipulation increased DTA among people high in attachment anxiety. Because anxiously attached individuals are especially sensitive to separation anxiety, merely imagining a hypothetical separation compromised the anxiety buffer and triggered an increase in DTA. In a subsequent study,

Florian, Mikulincer, and Hirschberger (2002) found that thinking about real problems in an ongoing romantic relationship increased DTA among participants, regardless of their attachment anxiety. Thus, DTA can become aroused in response to a relationship threat for anyone who is seriously invested in that relationship. In fact, even completing a fear of intimacy scale (Descutner & Thelen, 1991) can arouse insecurities that make death-thoughts more accessible to consciousness (Taubman-Ben-Ari, 2004).

One particularly significant relationship bond that helps allay concerns about death is that which forms between a parent and their child. From the perspective of TMT, children represent a physical manifestation of death-transcendence. Indeed, the longevity of one's family lineage relies upon having children that will themselves have children, and so on. The long-term viability of culture, itself, depends upon newer generations of people who take up the torch and perpetuate the cultural worldview. Children therefore represent an important means through which people manage death anxiety. Consistent with the DTA hypothesis, studies show that thoughts about being unable to conceive a child (Yaakobi, Mikulincer, & Shaver, 2014), thoughts of being separated from one's infant (Taubman-Ben-Ari & Katz-Ben-Ami, 2008), or actually having a child with a disability (e.g., autism; Cox, Eaton, Ekas, & Van Enkevort, 2015) increases DTA relative to controls.

Threats to the Human–Animal Boundary

Another means through which people manage existential concerns is by maintaining a sharp boundary between humans and animals. The underlying motivation for creating cultural worldviews and striving for self-esteem is a flight from corporeality into a world of undying symbols (Becker, 1973). In other words, the cultural anxiety buffer represents a symbolic solution to the problem of physical death. Anything that threatens to expose our bodily, creaturely nature therefore compromises our terror management defenses, and brings death thoughts closer to mind. Many of the initial studies in support of the DTA hypothesis were conducted to test this reasoning in relation to sex. According to TMT, sex represents an anxiety-inducing issue for many people because it reminds us of our physical, animal nature. In one study, Goldenberg, McCoy, Pyszczynksi, Greenberg, and Solomon (2000) found that having people think about the physical (vs romantic) aspects of sex increased DTA, but only among people who scored high in neuroticism. Goldenberg et al. (2000) reasoned that people who are high in neuroticism may have difficulty maintaining the human–animal boundary, which makes them more susceptible to information (such as sex) that blurs this boundary. In support of this reasoning, Goldenberg, Cox, Pyszczynski, Greenberg, and Solomon (2002) found that priming human–animal similarities prior to having participants think about physical aspects of sex increased DTA

regardless of neuroticism. Moreover, priming human–animal differences eliminated the effect of thinking about the physical aspects of sex on DTA.

Several additional studies examining the DTA-arousing effects of threats to the human–animal boundary focused specifically on the emotion of disgust. Research suggests that humans are somewhat unique in their tendency to experience disgust, especially that elicited by moral violations (Haidt, Rozin, McCauley, & Imada, 1997). According to TMT, disgust is aroused precisely when the human–animal boundary is threatened, and the emotional reaction may represent a visceral rejection of creatureliness and corresponding vulnerability to decay and death. Consistent with this reasoning, Cox, Goldenberg, Pyszczynski, and Weise (2007) found that exposure to disgust-eliciting images (e.g., feces, vomit) increased DTA when human–animal similarities where primed. By contrast, when human–animal differences were primed, viewing the disgusting imagines had no impact on DTA. However, extremely disgusting stimuli were found to increase DTA regardless of priming condition. Presumably, the extremely disgusting stimuli increased DTA in the absence of the creatureliness prime because they were more likely to trigger feelings of disgust. In support of this idea, recent research by Webber, Schimel et al. (2015) shows that the ability to reappraise a disgusting stimulus (and thereby reduce the extent to which it arouses feelings of disgust; Gross, 1998) eliminated the effect of viewing disgusting images on DTA.

Threats to Structured Meaning

Finally, whereas many DTA hypothesis studies have examined the effects of threats to broad-level meaning systems (e.g., Nationalism, Religion), several additional studies have focused on specific features that may be found in any worldview. Two features that appear to be especially important for allaying death concerns are structure and meaning (see Chapter 5, this volume).

Although all worldviews provide at least a minimum amount of structure (e.g., language for describing, explaining, and evaluating events), people who are high in personal need for structure (PNS; Neuberg & Newsome, 1993) appear to be particularly attracted to structure-conferring worldview beliefs. From a TMT perspective, this need for structure may stem from an underlying fear of death. An orderly and predictable environment helps to convey a sense of control over events that may normally seem random and uncontrollable (e.g., death). For example, the belief in a just world (BJW; Lerner, 1980), where people get what they deserve in life, can provide a sense of control over negative life events. If the world is just, then bad things will only happen to bad people, and being a good person is entirely within one's control. As such, events that appear to violate the belief in a just world should increase DTA. Consistent with this idea, Landau et al. (2004) found that having participants read about an innocent victim of a crime increased

DTA among participants high in PNS. By contrast, however, if the victim was portrayed negatively, suggesting that justice may have been served rather than violated by the crime, DTA remained low. Similarly, Roylance et al. (2014) found that people with high BJW had higher DTA after thinking about a past event that was unfair; these researchers also found that people with high BJW evinced higher DTA immediately after the 2012 presidential election if they had supported the losing candidate.

Along similar lines, structured worldviews also offer a sense of coherence and meaning. Existential psychologists have long recognized the importance of meaning in life for managing existential anxiety (e.g., Frankl, 1946). At an even more basic level, however, the meaning maintenance model (MMM; Heine, Proulx, & Vohs, 2006) maintains that mere expectancy violations are equally important. According to the MMM, meaning functions primarily to facilitate understanding and enable more accurate expectations for the future. Several studies in support of the MMM show that meaning violations increase worldview defense, and other types of compensatory meaning-affirmations in various domains (see Proulx, 2012 for a review). From the perspective of TMT, meaning threats should be especially likely to increase worldview and self-esteem defenses if they threaten the integrity of the anxiety buffer, and thus increase DTA. Proulx and Heine (2008, 2009) provided an initial test of this idea in an attempt to rule out the TMT interpretation of their results. These studies found no differences between meaning threat conditions and no-threat controls. However, several methodological issues with these studies led Webber, Zhang, et al. (2015) to reexamine this hypothesis using more typical DTA-study protocols. Furthermore, they examined PNS as a potential moderator of the DTA effect. Consistent with TMT's DTA hypothesis, exposure to meaning violations increased DTA relative to no-threat control, but only among participants high in PNS.

The Anxiety-Buffer Hypothesis

Prior to TMT, a substantial literature had revealed that having high self-esteem was positively linked to various indicators of well-being and negatively associated with indicators of dysfunction, including anxiety (Solomon, Greenberg, & Pyszczynski, 1991). However, much of this early literature was correlational and there was no theoretical basis for why self-esteem might be related to well-being. Moreover, a number of isolated theories in psychology posited that self-esteem was a core motive driving many forms of human social behavior such as identification with successful groups, dissonance reduction, self-serving attributions, and normative social influence, to name a few. Although these and other mini-theories assumed a basic desire to maintain positive self-evaluations, there was no explanation for how this need developed or what psychological function it ultimately served. TMT was developed to provide an explanation for this

need (Greenberg, Pyszczynski, & Solomon, 1986; Pyszczynksi, Greenberg, Solomon, Arndt, & Schimel, 2004).

According to TMT people need self-esteem because it shields them from anxiety. Self-esteem buffers anxiety because it is a symbolic extension of the more basic attachment mechanism. Succinctly, being "good" in the eyes of others signals emotional closeness to protective attachment figures in childhood, which reduces fear. Moving into adulthood this same association with being good and feeling protected is extended to meeting cultural standards of value and feeling safely embedded in the broader, death-transcendent culture, which buffers death-related fears. Thus, self-esteem should function to buffer individuals from (1) the general experience of anxiety and (2) from thoughts and concerns about death.

Self-Esteem Is a General Purpose Anxiety Buffer

The first series of studies directly testing the anxiety-buffer hypothesis examined if boosting self-esteem would predict lower levels of anxiety in response to threats (Greenberg, et al., 1992). In the first study, participants were given false personality feedback that was either mildly positive or extremely positive. Participants then watched a neutral video or an anxiety provoking video with graphic death imagery and completed a state anxiety scale. When the feedback was mildly positive, participants reported having very high anxiety after watching the death video compared to the neutral video. However, if the participants received extremely positive feedback, their level of anxiety following the death video was no higher than participants that watched the neutral video. Studies 2 and 3 conceptually replicated this pattern of results in which self-esteem was boosted (or not) through either positive personality feedback (Study 2) or successful performance on a test (Study 3). In each study, anxiety was measured as skin conductance level in anticipation of receiving a painful electric shock. These results showed the same pattern as that of Study 1: increasing participants' self-esteem reduced their skin conductance levels to that of participants in the control condition.

Self-Esteem Buffers Defensive Reactions to Mortality Salience

As reviewed earlier, numerous studies have shown that subtle reminders of death increase people's need to defend their worldview. If self-esteem buffers people's concerns about death, then individuals with higher self-esteem should be less likely to exhibit worldview defense in response to death reminders. To test this idea, Harmon-Jones et al. (1997, Study 1) gave participants positive or neutral feedback about their personality and then reminded them of their mortality or not. Later, the participants evaluated an essay written by a foreigner that either attacked or praised their country. Participants that received neutral personality feedback showed the typical MS effect of praising the worldview supporting essay and disliking the

worldview attacking essay. However, participants who had their self-esteem raised through positive personality feedback showed no worldview defense in response to MS.

Further support for the anxiety-buffer hypothesis has shown that higher self-esteem reduces proximal defenses aimed at denying one's vulnerability to an early death. In two studies, Greenberg et al. (1993) found that participants with experimentally boosted self-esteem (Study 1) or high-trait self-esteem (Study 2) were less likely to deny having a trait (emotionality) they were led to believe was associated with a short life expectancy. Participants that did not receive a self-esteem boost or who had low-trait self-esteem were more likely to deny having the death associated trait. See Chapter 7, this volume for a more nuanced discussion of how self-esteem relates to defensive responses to MS.

Self-Esteem Buffers Against Death-Thought Accessibility

A large body of work shows that MS leads to a delayed increase in DTA, and that heightened DTA coincides with the appearance of worldview and self-esteem defenses following MS (see Chapter 2, this volume). If self-esteem buffers against thoughts and concerns about death, then people with higher or fortified self-esteem should have lower DTA in response to MS. Several studies support this prediction. In Study 3 of Harmon-Jones et al. (1997), MS (vs control) led to increased DTA, but only after a lengthy delay. However, raising participants' self-esteem with positive personality feedback eliminated this delayed increase in DTA. Similarly, Mikulincer and Florian (2002, Study 3) found that giving participants an opportunity to defend their self-esteem by making external attributions for failure (e.g., I failed because the test was rigged) prevented them from having increased DTA following MS.

As discussed earlier, a large body of work supporting the DTA hypothesis shows that DTA increases following a potent threat to people's core worldview beliefs and bases for self-esteem. The anxiety-buffer hypothesis predicts that higher self-esteem should buffer individuals from DTA following these types of threats too. In support of this idea, Hayes, Schimel, Faucher, et al. (2008) threatened participants' self-esteem by telling them they would have to give an impromptu speech for other participants who would evaluate their performance. Participants who thought they had to give the speech had higher DTA than control participants. However, if participants were given an opportunity to fortify their self-esteem through a self-affirmation treatment prior to the public speaking threat their DTA remained low.

In a secondary analysis of prior research, Sharp, Schimel, and Blatter (2017) found more support for the anxiety-buffer hypothesis. In this analysis, data from 10 published studies supporting the DTA hypothesis were combined into a single dataset. Each study used a different type of worldview or

self-esteem threat that was found to increase DTA relative to a nonthreatening control condition. Thus, we were able to construct a large dataset (over 600 participants) consisting of two conditions: anxiety-buffer threat versus no threat. Participants in each study completed the same word-fragment completion measure of DTA. Because all of the studies were conducted in our own research lab, we were able to retrieve participants' trait self-esteem scores (Rosenberg, 1965) from a prior mass-testing survey, which allowed us to examine if high self-esteem would buffer participants from DTA under conditions of anxiety-buffer threat. The results confirmed this prediction. Anxiety-buffer threats increased DTA relative to control conditions; however, participants with higher trait self-esteem had significantly lower DTA in response to anxiety-buffer threats compared to participants with lower self-esteem.

Seven Immortality Postulates

> *It doesn't matter whether the cultural hero-system is frankly magical, religious, and primitive or secular, scientific, and civilized. It is still a mythical hero-system in which people serve in order to earn a feeling of primary value, of cosmic specialness, of ultimate usefulness to creation, of unshakable meaning. They earn this feeling by carving out a place in nature, by building an edifice that reflects human value: a temple, a cathedral, a totem pole, a sky scraper, a family that spans three generations. The hope and belief is that the things that man creates in society are of lasting worth and meaning, that they outlive or outshine death and decay, that man and his products count.*
>
> Ernest Becker (1973)

A primary assumption of TMT is that cultural worldviews and self-esteem function to allay concerns about death by providing people with a sense of death-transcendence in the form of literal or symbolic immortality. Cultural worldviews are shared belief systems that exist in the collective minds of the individuals which makes up the culture, and thus continue beyond the death of individual members. Thus, cultural worldviews are potentially eternal so long as "believers" can perpetuate them from one generation to the next. Of course, the specific content of religious worldviews offers the promise of a literal afterlife, which addresses the problem of death directly. But, as indicated in the excerpt above, cultural worldviews also provide avenues for symbolic immortality through the pursuit of self-esteem. By meeting cultural standards of "goodness" individuals can feel as though their essence, or selfhood, is being weaved into the enduring cultural fabric. Noteworthy achievements in cultural domains such as sports, music, science, literature, or film, earn people a feeling of self-worth, which might better be described as a feeling of immortality. Indeed, humans tend to construct elaborate memorials in which exceptional

achievements in important cultural domains are celebrated and remembered (e.g., halls of fame, museums, time-honored awards, libraries). Although many people may never reach these levels of cultural fame, having well-established memorials for such achievements gives people the hope of being remembered. Of course there are countless other ways that people work to achieve symbolic immortality. Leaving behind a legacy to one's children, maintaining a deeply held philosophical or ethical "truth," attaching oneself to durable cultural objects or histories, and fostering a special connection to a region or plot of land, are all ways people can obtain a sense of life-continuity (Lifton, 1979).

Although a desire for immortality is a core tenant of TMT, only a handful of studies have directly examined the immortality motive as a form of terror management. Moreover, no studies have examined the specific assumption that cultural worldviews and self-esteem allay concern about death because they possess an immortality component. We therefore present, a priori, a series of testable predictions concerning the role of immortality in people's defense of the cultural worldview and self-esteem that could be fruitful of new research directions. In this presentation we review some of the work in this area that has already been conducted and highlight work that could still be done.

The first two predictions are guided by the **mortality salience hypothesis** and begin with the following statement: *If cultural worldviews and people's bases for self-esteem alleviate concerns about death by giving people the hope of transcending death, then:*

Hypothesis 1a: *Reminders of death should increase people's belief that their culture and the subcultures that support their bases of self-esteem will exist long into the future.*

Hypothesis 1b: *Reminders of death should increase people's liking and valuing of durable cultural affectations and decrease liking and valuing of ephemeral cultural affectations.*

Initial evidence for *Hypothesis 1a* can be found in recent research on the tendency to eulogize the deceased. Specifically, Hayes (2016) found that people will spontaneously increase the positivity with which they describe and evaluate someone after thinking about that person's death. Hayes argues that this tendency represents a motivational urge to preserve their memory (i.e., grant them symbolic immortality). This research provides indirect support for Hypothesis 1a because the effect pertains to people's ratings of others who are deceased (not oneself), but is nevertheless consistent with a general immortality motive. Even more recently, Lifshin, Greenberg, Soenke, Darrell, and Pyszczynski (in press) examined attitudes toward medical technology purported to offer the possibility of indefinite

life extension (ILE). These researchers found that MS increased positive attitudes toward ILE, but only among nonreligious participants. Interestingly, the effect was mediated by a reduction in afterlife beliefs, suggesting that the possibility of indefinite life may preclude the need for such beliefs. Another study supporting Hypothesis 1a showed that MS increased Spanish participants' perception that the cultural norms and traditions of their group have been effectively transmitted from one generation to the next, and that their cultural history has remained stable over time (Sani, Herrera, & Bowe, 2009). Although these perceptions contain other affirming beliefs about their culture, such as structured meaning and tradition, they also strongly imply continuity over time, and thus group immortality. Future research could also test *Hypothesis 1a* directly by assessing the effect of MS on the perceived longevity of one's cultural worldview and the subcultures that advance one's specific claims to symbolic immortality.

McCabe, Spina, and Arndt (2016) recently found some initial support for *Hypothesis 1b*. Participants in this study were reminded of their own death or of pain and then evaluated a series of mundane objects (e.g., a pen, mug, umbrella, watch, chair) that were supposedly new versus really old. When reminded of death (vs pain) participants placed a higher value on the objects if they also thought these objects were older and possibly antiques. Also supporting *Hypothesis 1b* are a series of studies showing that reminders of death increase people's desire for fame. Fame is a clear form of symbolic immortality because once a person becomes famous, he or she has become immortalized within the culture. In support of this idea, Greenberg, Kosloff, Solomon, Cohen, and Landau (2010) found that MS increased people's personal desire for fame (Study 1), their desire to have a star in the galaxy named after them (Study 2), and their desire to attach themselves to famous celebrities (Study 3).

Another prediction is guided by the logic of the **death-thought accessibility hypothesis**, and is stated as follows:

Hypothesis 2a: *If the death-transcending properties of cultural worldviews and self-esteem alleviate concerns about death, then stripping one's cultural worldview and bases of self-esteem of their death-transcending properties should increase DTA.*

Stated differently, *undermining people's belief that their culture and bases of self-esteem will last long into the future should increase DTA.* To date, no research has tested this hypothesis.

A final series of predictions are guided by the **anxiety-buffer hypothesis**. These predictions begin with the following statement: *If the death-transcending properties of cultural worldviews and self-esteem function to alleviate concerns about death, then:*

Hypothesis 3a: *Bolstering people's belief in literal or symbolic immortality should reduce the effect of mortality salience on worldview and self-esteem defense.*

This hypothesis is supported by a series of three studies reported in Dechesne et al. (2003). In the first two studies of this research, MS led participants to evaluate positive feedback about their personality as more valid. However, convincing participants that near-death experiences constitute evidence of life after death eliminated this tendency. In a third study, Dechesne et al. found that increasing participants' belief in the afterlife reduced the effect of MS on striving for wealth (symbolic self-esteem striving) and punishment of moral transgressors (worldview defense). These studies offer some evidence that belief in literal immortality buffers concerns about death.

Research by Harmon-Jones et al. (1997, Study 1) is also consistent with *Hypothesis 3a*, showing that boosting self-esteem (i.e., symbolic immortality) reduced worldview defense in response to MS. However, no research has tested this buffering hypothesis with respect to symbolic immortality specifically. This more targeted hypothesis might be stated as follows: *bolstering the specific belief that one's symbolic representation of self (i.e., achievements) will last long into the future should reduce the effect of MS on worldview and self-esteem defense*. Likewise, research has yet to examine whether boosting symbolic immortality in this specific way would reduce people's need to believe in literal immortality (i.e., belief in the afterlife) following MS. Research should address these possibilities.

A similar prediction that follows the anxiety-buffer hypothesis is that fortifying people's belief in their literal or symbolic immortality should also buffer the effect of MS on DTA, as stated in *Hypothesis 3b* below.

Hypothesis 3b: *Bolstering people's belief in literal or symbolic immortality should eliminate the effect of mortality salience on elevated DTA.*

Hayes' (2016) recent research on eulogizing the deceased may also offer preliminary support for this hypothesis. Study 3 showed that imagining the death (vs not) of a close other increased DTA, unless they were provided with an opportunity to eulogize the person, in which case DTA remained low. Thus, bolstering the symbolic immortality of our loved ones may help to alleviate distress when they are lost. This hypothesis could be further assessed with respect to boosting people's belief in their own immortality by promoting the belief that their symbolic self will be remembered.

Another prediction is based on a TMT analysis of disgust. From this view, animal nature disgust (e.g., images of human excrement or vomit) is existentially unsettling because it reminds humans of their animal nature, that they are made of flesh and blood and thus destined to decay and die. Indeed, research has shown that exposing participants to these types of

disgusting stimuli while drawing attention to similarities between humans and animals increases DTA. If a sense of immortality combats the implications of disgust, that humans are animals destined to die, then increasing literal or symbolic immortality should reduce the effects of animal nature disgust, as stated in Hypothesis 3c below.

Hypothesis 3c: *Bolstering people's belief in their literal or symbolic immortality should reduce the effect of animal nature disgust on DTA and feelings of disgust.*

One final hypothesis addresses the specificity of immortality as the antidote to concerns about death, and is stated as follows:

Hypothesis 3d: *Stripping the cultural worldview and bases of self-esteem of their implications for immortality should render these psychological structures less effective as a buffer against thoughts of death.*

If supported, Hypothesis 3d would provide strong evidence for the notion that a hope of immortality inherent in cultural worldviews and self-esteem functions to alleviate concerns about death. Stripping these psychological structures of their death-transcending properties, without decreasing their affectively positive implications for the individual, should reduce their ability to manage existential fear. One way of stripping these psychological structures of their immortality component might be to convince participants that their culture or the subcultures that support their bases of self-esteem, though currently valued, are nevertheless fleeting, and unlikely to last into the next generation.

In sum, TMT's three key hypotheses can be used to generate a number of more specific, testable hypotheses concerning the role of immortality beliefs in people's defense of the cultural worldview and self-esteem. We suggest these hypotheses as a starting place for future research, though there are likely additional, nuanced predictions that can be derived as well.

SUMMARY AND EPILOGUE

In this chapter, we reviewed a portion of the large body of work supporting TMT's three primary hypotheses: the MS hypothesis, the DTA hypothesis, and the anxiety-buffer hypothesis. Experiments testing the MS hypothesis have confirmed that reminders of death intensify people's need to uphold faith in their cultural worldview and pursue self-esteem. As this review showed, the need to deny death by feeling securely embedded in a cultural worldview can lead to some of the most despicable of human behaviors, namely prejudice and hostile aggression toward those who advance a different death-denying ideology. On the other hand, when people derive meaning

and self-worth from being compassionate and generous, the same need to deny death can also inspire some of the most laudable forms of human behavior. Studies testing the DTA hypothesis have also confirmed that cultural worldviews, self-esteem, and other protective structures such as relationships, beliefs that separate humans from their animal nature, and structured meaning, all function to keep thoughts of death below the threshold of consciousness. When people's faith in these protective beliefs are called into question, thoughts of death creep closer to awareness. Finally, studies testing the anxiety-buffer hypothesis show that self-esteem, the belief that one's life has enduring meaning and purpose, functions to protect people from anxiety in general, and from worries about death and dying, specifically.

We introduced this chapter with the assertion that—from a Kuhnian perspective (Kuhn, 1977)—TMT has been an incredibly fruitful theory, generating a multitude of novel, testable hypotheses concerning the role of cultural worldviews and self-esteem in controlling existential fear. Although a handful of theories have emerged in recent years to provide alternative (post hoc) explanations for the effects of MS on cultural worldview defense and self-esteem striving (see Chapter 3, this volume), TMT was the first theory to predict a causal relationship between death and these psychological structures. With the exception of Ernest Becker and other existential thinkers, prior to TMT, social scientists had not seriously considered the possibility that thoughts of death, which have no logical or semantic link to cultural worldviews or self-esteem, would motivate defense of these constructs. Likewise, what is interesting about studies testing the DTA hypothesis is that death thoughts become more accessible even though threats to people's core beliefs make no explicit mention of death or death-related ideas. In other words, TMT predicted relationships between variables that were previously unknown. In similar fashion, prior to TMT, social scientists had been studying the concept of self-esteem for decades, and yet there was little consensus as to what self-esteem was or what specific psychological function it served. One of the key predictions of TMT, based on a synthesis of John Bowlby's work and that of Ernest Becker, is that self-esteem should serve an anxiety-buffering function. Research inspired by TMT confirmed this functional perspective of self-esteem.

In our literature review, we also noted that TMT forecasted a paradoxical relationship between death-thoughts and symbolic defenses. Specifically, experiments showed that priming death led people to pursue symbolic value in ways that increased their vulnerability to actual death (e.g., sun tanning and reckless driving)—and having people think about the death of worldview threatening others, ironically reduced the accessibility of death-thoughts that were initially aroused by these threatening others. These counterintuitive predictions would have been difficult to derive using other more general threat-defense models or simplistic priming accounts.

Finally, to further demonstrate the generative power of TMT, we derived a series of testable predictions concerning the role of immortality in people's defense of the cultural worldview and self-esteem. Although TMT has specified death-transcendence as the key ingredient within cultural worldviews and self-esteem for combating the problem of the knowledge of our own mortality, only a few studies have directly tested this component of the theory. Our hope is that putting these predictions forward will inspire new ideas and research endeavors.

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Chapter 2

Proximal and Distal Terror Management Defenses: A Systematic Review and Analysis

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Is there no change of death in paradise?
Does ripe fruit never fall? Or do the boughs
Hang always heavy in that perfect sky ...

Wallace Stevens, *Harmonium* (excerpt from *Sunday Morning*, 1923)

The human animal is in a tough predicament. On one hand, people are equipped with impressive cognitive abilities that permit supreme mental flexibility. Yet, even the most remarkable mind is tethered to a flimsy, vulnerable body that will perish like yesterday's tomatoes. And worst of all, humans know they are doomed to die. Nevertheless, *Homo sapiens* has emerged as the dominant species on planet Earth. These self-aware apes lord it over the natural world, seemingly oblivious to the reaper. Is death really no big deal to them?

In fact, this apparent ease is a carefully constructed illusion. Three decades of research on terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) have shown that peoples' unconscious minds are constantly battling against the idea of mortality. Death-related concerns persist beneath the surface of focal awareness, playing a central role in the processes by which individuals regulate their behavior. This chapter presents an empirically driven account of the psychological mechanisms that keep death-related thoughts hidden behind the veil of human consciousness.

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HISTORICAL BACKGROUND

Research on this subject originally built upon two prominent psychological movements. First is the psychodynamic tradition, within which the major intellectual foundations of TMT reside (Becker, 1973; Freud, 1915/1959; Rank, 1936/1978). Freud's idea that unconscious concerns exert profound motivational influences on human behavior has been pivotal throughout 20th and 21st century psychology. The concept of nonconscious motivational forces is central to noteworthy psychological theories (e.g., Carver & Scheier, 1981), and Becker's proposal that unconscious death concerns drive large portions of cultural activity is consistent with basic tenets of evolutionary theory (Landau, Solomon, Pyszczynski, & Greenberg, 2007; Solomon, Greenberg, Schimel, Arndt, & Pyszczynski, 2004).

However, these ideas were at first quite controversial, in part because of the challenges inherent in substantiating the existence of unconscious processes. This gap was bridged through innovative integration of psychodynamic insights with methodological developments in cognitive science. With the cognitive revolution of the 1950s and the subsequent emergence of social cognitive approaches (e.g., Erdelyi, 1985; Kunda, 1990), it became apparent that many human mental processes have two distinct and measureable information-processing components (i.e., dual processes). One is oriented to the controlled recall and rational manipulation of explicit, declarative information; the other is more intuitive, implicit, and functions in the automatic acquisition of knowledge and skills (e.g., Graf & Schacter, 1985; Squire, 1992). Consistent with Freud's idea that the unconscious exerts sophisticated and goal-directed influences on conscious activity, it was eventually established that motivational states, triggered via automatic information-processing routes, can impinge upon people's discrete, intentional behaviors (e.g., Bargh, Raymond, Pryor, & Strack, 1995; Cesario, Plaks, & Higgins, 2006). This discovery set the stage for TMT researchers to formulate a testable framework regarding unconscious death concerns and their motivational impacts on conscious human social behavior.

AN EXISTENTIAL-PSYCHODYNAMIC MODEL OF DEATH-RELATED COGNITION AND BEHAVIOR

The crowning achievement in this vein is the dual-process model of terror management, which has been subjected to extensive testing throughout the world since its inception in the mid-1990s (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994; Pyszczynski, Greenberg, & Solomon, 1999). This model specifies a sequence of conscious and unconscious defensive processes, leading from the elicitation of mortality salience (MS) to defensive terror management outcomes. This chapter outlines the varied

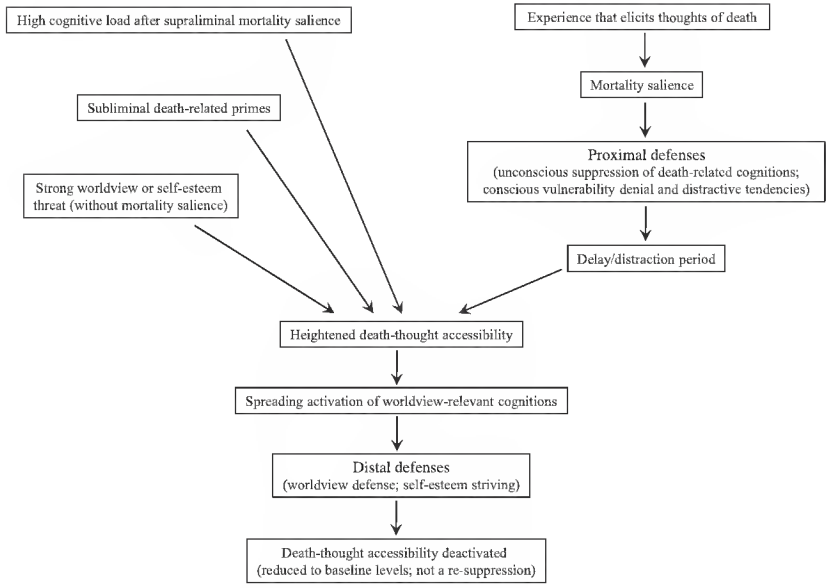


FIGURE 2.1 The dual-process model of terror management.

components of this model, but starts here with a brief overview of its basic elements (see Fig. 2.1).

First, some feature of the environment elicits existential concerns with death. When individuals are then explicitly thinking of their demise, they exhibit *proximal defenses*: effortful, unconscious suppression of death-related thoughts, coupled with conscious, pseudorational efforts to deny vulnerability to death or to distract attention from that problem. Importantly, these proximal defenses are direct, literal counters to the idea of death. They bear down on that threat by minimizing it in seemingly logical ways (e.g., "I'm not going to die anytime soon. . ."). However, as thoughts of death gradually recede from consciousness, people exhibit *distal defenses*: the initially suppressed thoughts of death begin percolating in the individual's unconscious mind, provoking responses aimed at procuring self-esteem and maintaining faith in a cultural worldview. Fascinatingly, although these distal responses are triggered by death-related concerns, they typically do not bear obvious superficial, logical, or semantic relations to the physical threat of mortality per se. Rather, they are symbolic efforts to promote a personal sense of cosmic heroism and continuance: a sense of death transcendence via cultural inroads to literal or symbolic immortality. Of utmost importance, engaging distal defenses reduces unconscious death-related concerns back to low, baseline levels.

This model centers on ways the mind responds to subconscious death concerns. Key in this regard is a phenomenon termed *death thought*

accessibility, or DTA: the activation of death-related thoughts outside of current focal attention. DTA is measured in two ways (see Chapter 4, this volume). One technique presents participants with word fragments that can potentially be completed in death-related ways (e.g., D E _ _, which could be *dead* or *deal*; G R A _ _, which could be *grave* or *grade*), such that individuals evince more active death-related thoughts by providing more death-related completions. The other technique presents participants with letter strings on a computer screen, asking them to rapidly identify (via keyboard button press) if the strings are words (e.g., SNEAKER) or nonwords (e.g., BLORF). Some of the words are death-related (e.g., DEATH, GRAVE). Faster reaction times in identifying those death words indicate greater cognitive activation of death-related thoughts. Importantly, both of these techniques—the word fragment measure and the lexical decision measure—assess DTA in manners that are unadulterated by conscious thought. Consciously, participants simply think they are listing or identifying words, and show no particular awareness that death-related content is being assessed. These techniques thus produce unobtrusive measures of unconscious death thought activation.

DTA has received exhaustive examination and review, primarily because this construct undergirds some of the most important claims from research on the dual-process model of terror management (e.g., Hayes, Schimel, Arndt, & Faucher, 2010). As later described, it is by measuring DTA that the initial (proximal) suppression of unconscious death-related thoughts can be empirically verified, as well as the subsequent (distal) activation, and finally, the deactivation after distal defense occurs. A later section of this chapter presents deep consideration of the interpretation of DTA. At this juncture, it is important simply to grasp this construct's operationalization and the central role DTA plays in the study of terror management processes.

PRELUDE TO THE MODEL: A NOTE ON INTERPRETATION

Before proceeding to a granular account of this scientific literature, two preliminary considerations are appropriate.

First, this chapter summarizes and analyzes a plethora of studies illustrating proximal and distal responses to mortality, identifying fruitful directions for future research along the way. However, adopting a rather mechanistic focus on process-oriented research risks missing the theoretical forest for the empirical trees. Readers are thus encouraged to consult other chapters in this volume for insight into the many basic and applied extensions of TMT that have emerged over the past 30 years.

Second, TMT experiments typically occur over brief time periods (e.g., mere minutes). Yet, the results may also indicate how the processes in question play out across broader timescales. For instance, major terrorist attacks

have the potential to elicit sustained conscious awareness of mortality in large populations, extending the initial proximal defensive phase by minutes, days, and even months, and prolonging the subsequent distal phase in complimentary fashions (Pyszczynski, Solomon, & Greenberg, 2003). Accordingly, readers are encouraged to consider that the short-term laboratory outcomes herein identified may unfold over longer timeframes in real-world contexts.

THE DUAL-PROCESS MODEL OF TERROR MANAGEMENT

First Things First: Eliciting Mortality Salience

Daily life is fraught with stimuli and events that have the potential to trigger thoughts of death. Doctor's visits, social and news media reports of violent conflict, policy issues like abortion, gun control, and terrorism—these and many other routine phenomena threaten to project the existential reality of mortality into conscious awareness. Terror management defenses have evolved to protect humans from the emotional implications of such reminders. Hence, the sequence of psychological events outlined in TMT's dual-process model initiates when some aspect of the environment makes mortality salient.

In relevant experiments, MS has been operationalized in many ways, including exposure to gory accident video footage (vs neutral footage), close proximity to a funeral home (vs being 100 m away), and filling out death anxiety scales (vs nondeath scales). The most common approach, developed by Rosenblatt, Greenberg, Solomon, Pyszczynski, and Lyon (1989), entails having participants complete two open-ended questions: "Please briefly describe the emotions that the thought of your own death arouses in you" and "Jot down, as specifically as you can, what you think will happen to you as you physically die, and once you are physically dead." Control participants instead respond to parallel questions about either neutral topics (e.g., shelving books, watching television) or aversive topics (e.g., pain, failure).

Effects of MS are most pronounced when the triggering stimulus causes people to think about *their own* death (e.g., Greenberg et al., 1994). This is consistent with the idea that people fear death because it conflicts with biologically rooted instincts for self-preservation. Although thinking about the death of close others (e.g., loved ones) can elicit moderate defensiveness, this is likely because such thoughts provoke moderate degrees of personal mortality concern (Greenberg et al., 1994). Similarly, members of collectivist cultures define the self in ways that are intimately bound to others, and consequently show pronounced defensiveness in response to thoughts of collective mortality (Kashima, Halloran, Yuki, & Kashima, 2004). In sum, the self and its fragility play a central role in MS-induced defensiveness.

Proximal Defenses

How do people respond when consciously confronting the idea of their demise? A characteristic reaction is to psychologically diminish the perceived reality of death, making it seem less impending and personally threatening. Indeed, within the first couple minutes after explicit mortality reminders (i.e., the proximal phase), various unconscious and conscious defenses are deployed to help individuals avoid thoughts of death and vulnerability.

Suppression of Unconscious Death-Related Thoughts

It is intuitive to consider that unconscious death-related thoughts would be particularly active right after a conscious death reminder. But the unconscious is vigilant, active, and capable of keeping a lid on undesired thoughts. Immediately after exposure to self-relevant threats, individuals often unconsciously suppress unwanted cognitions. This defensive maneuver helps people avoid fully experiencing the negative emotions such thoughts could elicit (e.g., Martin, Tesser, & McIntosh, 1993). Likewise, at the proximal stage, the unconscious effortfully suppresses DTA. Immediately after explicit mortality reminders, mortality salient people do not exhibit greater DTA than control condition participants (Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997; cf. Trafimow & Hughes, 2012). However, if suppressive mental resources are usurped by a secondary mental task (a procedure termed *cognitive load*), DTA does increase right after MS. For instance, immediately after MS, participants showed elevated DTA when simultaneously tasked with holding an 11-digit number in mind (Arndt, Greenberg, Solomon, et al., 1997). Parallel suppression and cognitive load effects occur immediately after individuals are induced to think of various death-related topics, such as cancer (Arndt, Cook, Goldenberg, & Cox, 2007) or feces (Dunkel, 2009).

If explicit death reminders instigate effortful, resource-sapping cognitive suppression, then individuals in the proximal phase should exhibit difficulty on cognitively demanding tasks. Consistent with this idea, performance on standard cognitive tasks is diminished after MS (e.g., Stroop tasks; Gailliot, Schmeichel, & Baumeister, 2006). Complex analytic and moral judgments show similar signs of impairment. In a study by Trémolière, De Neys, and Bonnefon (2014), immediately after MS, participants struggled to determine when syllogisms led to logically valid but unbelievable conclusions (e.g., No healthy person is unhappy; There are unhappy persons who are astronauts; Therefore, there are astronauts who are not healthy). Another study in this vein examined utilitarian responses to moral dilemmas (Trémolière, De Neys, & Bonnefon, 2012). Utilitarian resolutions often involve unpalatable sacrifices for the good of the majority (e.g., allowing one person to die in order to save the lives of five), and thus require individuals to employ elaborative reasoning above and beyond intuitive, emotionally driven

reactions. Trémolière et al. (2012) found that, immediately after MS, individuals were less likely to recommend utilitarian resolutions, such as deeming it morally acceptable for a civilian during wartime to smother his crying child in order to protect his other five children from approaching enemy soldiers.

Conscious Proximal Defenses: Rationalization and Distraction

As the unconscious labors to suppress DTA, individuals in the proximal phase have several conscious defensive tricks up their sleeves. First among these are *vulnerability-denying defensive distortions*: pseudorational efforts to diminish perceived vulnerability to death (also known as "not me, not now" responses; Chaplin, 2000). People frequently bias their thinking in ways that limit perceived vulnerability to disease or premature death (e.g., Jemmot, Ditto, & Croyle, 1986). Likewise, when consciously thinking about death, individuals think and act in manners that make their death seem less likely.

For instance, in a study by Greenberg, Arndt, Simon, Pyszczynski, and Solomon (2000), participants were presented with a (made-up) statement from the New England Journal of Medicine indicating that people who experience large swings in emotion are more likely to die young (or, that too little emotion puts people at such risk). Subsequently, individuals rated their own physical and psychological emotionality levels. Right after an explicit MS induction, participants showed a tendency to exaggerate their emotionality ratings in whichever direction (low or high) supposedly signaled longer life. Related research has shown that, immediately after MS, individuals report increased intentions to engage in fitness-related behaviors (Arndt, Schimel, & Goldenberg, 2003) and to buy high SPF sunscreen (Routledge, Arndt, & Goldenberg, 2004). These proximal outcomes are logically and semantically tied to allaying the physical threat of death, yet they are fundamentally pseudorational in nature. Though consciously aware that their actions are tied to literal health, longevity, or safety, people in these studies are unaware that such seemingly rational responses actually reflect emotional concerns with vulnerability triggered by MS.

As an alternative proximal defense, people sometimes exhibit avoidant, distractive tendencies aimed at pushing thoughts of mortality out of current focal attention. This usually occurs when the context in which death-related thoughts become conscious makes the denial of personal mortality particularly difficult. For instance, in a study by Arndt, Greenberg, Simon, Pyszczynski, and Solomon (1998), participants completed the standard two-question MS (or control) survey while seated in front of an enormous mirror (or without a mirror). The presence of the mirror promoted overwhelming attentional focus on the self, which, when combined with death contemplation, caused participants to write briefer responses and exit their cubicle more rapidly.

Distractive proximal responses to conscious mortality concerns have been of great interest to researchers applying TMT in health-related behavioral domains (for a review, see Goldenberg & Arndt, 2008). For instance, Arndt et al. (2007) used a cognitive load induction to undermine the initial suppression of DTA after a cancer salience manipulation. Participants responded with a last-ditch effort to distract themselves from the frightening idea of cancer by lowering their reported intentions to engage in cancer-related self-examinations. Similarly, Goldenberg, Arndt, Hart, and Routledge (2008) found that priming women to think of humans as mere physical (and thus mortal) creatures decreased the amount of time spent performing a cancer exam on a breast model. In the domain of smoking behavior, Arndt et al. (2013) found that conscious death concerns caused individuals with heavy smoking cravings to increase the volume, duration, and velocity with which they smoked five puffs of a cigarette. Ironically, some individuals distract themselves from death with behaviors known to cause it.

Parallel avoidance findings have occurred in research concerning economic decision-making. Many economists recommend annuitizing (i.e., exchanging a lump sum of savings for a guaranteed income stream across a set of fixed intervals for the rest of one's life). Yet, in a phenomenon termed the *annuity puzzle*, a surprisingly small number of retirees choose to do so (Benartzi, Previtero, & Thaler, 2011). Salisbury and Nenkov (2016) reasoned that the task of choosing an annuity triggers conscious thoughts of dying, which should activate proximal defenses to push the problem of death out of consciousness and so lessen consideration of this economically advantageous financial tactic. Indeed, immediately after MS, individuals from a wide range of age-groups (including retirees) were less likely to select an annuity when given the option to do so.

In sum, wide-ranging evidence establishes that individuals respond to conscious thoughts of death with varied and sometimes counterintuitive defenses. At the unconscious level, individuals effortfully suppress death-related cognitions. At the conscious level, individuals exhibit vulnerability-denying defensive distortions and efforts to distract themselves from their mortality. However, after the time frame of proximal responses passes, individuals proceed to demonstrate symbolic, distal defenses. These have been the primary focus of most TMT studies.

Distal Defenses

The distal defensive phase of the dual-process model is characterized by a vastly different cognitive-behavioral landscape than that observed at the proximal phase. At the distal stage, individuals are no longer consciously focalizing on the thought of death, nor unconsciously suppressing DTA, nor literally seeking to deny their physical vulnerability or distract themselves. Instead, death-related thoughts achieve a pronounced increase in unconscious

activation; and, once this occurs, people exhibit thought and behavior aimed at symbolic death transcendence. They mobilize psychological resources toward sustaining a meaningful cultural worldview and acquiring self-esteem, in order to feel personally connected to some form of immortalizing heroism.

Processing at the distal phase is thus deeply psychodynamic. Death-related concerns impinge just beneath the threshold of consciousness, motivating defensive behaviors that, on the surface, bear no resemblance to death (e.g., expressing nationalistic sentiment). Despite the symbolic nature of these affirmations, reinforcing a sense of meaning and value functions to reduce DTA and thus restore psychological equanimity.

Distal Defense Occurs When Death-Related Thoughts are Active on the Fringes of Consciousness

Several lines of research verify that distal terror management defenses occur when death-related thoughts are active subconsciously, just outside of current focal awareness.

Indirect support for this arises from research in which the nature of explicit MS inductions is varied. More subtle and experiential exposures breed stronger effects. The typical two-question MS induction is reasonably subtle, and reliably provokes distal defenses. Yet, the intensity of such effects lessens when participants engage in deeper contemplation of death [e.g., considering their deepest emotions about their death while imagining they had been diagnosed with advanced stage cancer; Greenberg et al., 1994 (also see Cozzolino, Staples, Meyers, & Samboceti, 2004)]. Similarly, distal effects of MS are more pronounced when various elements of the experimental situation promote a state of mind that is passive and preconscious, as opposed to rational and deliberative. Simon et al. (1997) observed normal MS-induced worldview defense when experimenters acted warmly and dressed casually, and when instructions encouraged participants to provide natural, gut-level responses. Yet, the effects were eliminated when the experimenter acted formally and dressed in a lab coat, or when instructions encouraged careful, rational analysis.

Studies employing subliminal presentations of death-related stimuli provide direct evidence that distal effects arise from subconscious death concerns. Up to this point, this chapter has only addressed explicit, supraliminal operationalizations of MS, which first elicit proximal defenses because they challenge participants to struggle through a conscious encounter with their ultimate fragility. However, when presentations of the word *death* or *dead* are subliminal—appearing so quickly on a computer screen that they cannot be consciously detected—the conscious, controlled system gets bypassed, and the proximal stage skipped entirely. In those instances, individuals show no signs of suppressed DTA. Rather, subliminal death primes (as compared

to control primes of negative or neutral words of similar length and lexical frequency) trigger immediate increases in DTA, and likewise, immediately elicit worldview defensive tendencies (Arndt, Greenberg, Pyszczynski, & Solomon, 1997). Subliminal primes of the word *cancer* have similar effects (Arndt et al., 2007).

The most common way of demonstrating that subconscious mortality concerns fuel distal effects involves the use of delay/distraction periods. Interposing a delay period between an explicit MS induction and subsequent measures of distal defensiveness ensures a psychological transition from the proximal processing phase to the distal processing phase. Central to this transition is an alteration in the way implicit death-related thoughts are processed. Recall that, at the proximal phase, the unconscious mind labors to suppress death-related thoughts (just as the conscious mind seeks to deny or avoid it). Although these mental activities seem dedicated to eradicating thoughts of death, they have the ironic consequence of prolonging the unconscious mind's preoccupation with that issue. Strenuous monitoring of death-related thoughts initially keeps them at bay; but, once individuals' conscious attention is distractively drawn to nondeath-related delay tasks, the initial defensive concentration on suppressing death-related thoughts backfires and potentiates postdelay increases in DTA (a process termed *rebound hyperaccessibility*; e.g., Wegner & Erber, 1992).

Consistent with this account, explicit MS, followed by a delay period, leads to heightened DTA and classic worldview defense and self-esteem striving effects (e.g., Arndt et al., 2003; Greenberg et al., 1994). Such outcomes do not naturally occur immediately after standard MS inductions (Greenberg et al., 2000), unless—as noted earlier—individuals are placed under condition of high cognitive load (Arndt, Greenberg, Solomon, et al., 1997). The delay/distraction method has been used in 93% of MS studies (as of a metaanalysis by Burke, Martens, & Faucher, 2010). During the delays (usually lasting 2–6 minutes), participants perform one or more tasks (e.g., completing questionnaires). Most often, participants complete the Positive and Negative Affective Schedule (PANAS; Watson, Clark, & Tellegen, 1988) or its expanded form (PANAS-X; Watson & Clark, 1992), and/or other innocuous filler surveys, word search puzzles, mood checklists, and reading tasks.

Longer delay periods produce stronger distal MS effects (Burke et al., 2010). As death-related thoughts recede further from focal attention, effect sizes for MS-induced DTA and symbolic defenses increase. This illustrates an important feature of MS effects. They do not simply involve transient activation of death-related cognitions that wanes over time (e.g., like the pain of a stubbed toe). Rather, they reflect the instigation of driven efforts to manage implicit death-related concerns—efforts that, like other motivational processes (e.g., hunger), increase over time if the motivation remains unsatisfied.

Interestingly, if the distraction interposed after supraliminal MS functions to amplify implicit death-related thoughts (i.e., by subliminally priming the word *death*), the result is an exceptionally strong delayed increase in DTA (Mahoney, Saunders, & Cain, 2014). Given that the strength of MS effects increases with longer delays, it may be that interposing subliminal death primes during the delay period accelerates instigation of the distal phase. This *double-death priming* technique has not been used extensively to date, but represents an exciting methodological innovation.

In the Distal Phase, Unconscious Thoughts of Meaning and Value Become Accessible

When DTA is elevated, people strive for meaning and value. One cognitive indicator of this manifests when, after MS and a delay, individuals exhibit increased accessibility of constructs relevant to their worldview. Fascinatingly, making people subtly think about their death—and then distracting them from that idea for a bit—leads their unconscious to home in on ideas related to cultural bases of symbolic transcendence.

At first, this may seem farfetched. However, further consideration of cognitive processes reveals it to be a quite logical and natural result. Concepts associated in memory have a tendency to (unconsciously) team up. Without any deliberate effort, thinking about doctors makes people think about nurses, just as thinking about hunger leads many to reflexively think about burritos and pizza. Likewise, because worldview contents are intimately and unconsciously bound in memory to the management of death-related concerns, unconscious death-related thoughts automatically activate unconscious thoughts of worldview contents. This process, by which activating specific concepts heightens the accessibility of related conceptual material, is termed *spreading activation* (e.g., McKoon & Ratcliff, 1992).

In illustrating this, Arndt, Greenberg, and Cook (2002) found that, among women, MS (followed by a delay period) resulted in heightened accessibility of romantic constructs (e.g., completing the word fragment _OVER as *lover* rather than *cover*). The occurrence of this effect among women, but not men, was attributed to the idea that romantic relationships represent a particularly potent route to meaning for women. Consistent with the overall model, this effect did not occur if a delay period was not inserted after MS. Moreover, this effect also occurred immediately after women were subliminally primed with the word *dead*, but did not happen in a control condition where the subliminal prime was negative but not death-related (i.e., the word *fail*). In another study, Arndt et al. (2002) found the same pattern of effects among men, but with respect to the activation of nationalistic constructs (e.g., completing F _ _ G as *flag* rather than *frog*). Men, it was argued, have internalized a worldview that tends to emphasize nationalism more than females' do (Geary, 1998). This latter finding at first seemed curious, given that prior

research had shown MS-induced pro-US bias not to be moderated by gender. However, in a final study, both men and women who had first been induced to think about the meaning of their American identity responded to explicit MS + a delay with heightened accessibility of nationalistic constructs. Accordingly, at the distal phase, MS amplifies thought related to personally relevant and situationally pressing elements of an individual's worldview.

An interesting remaining question is whether, after MS and a delay, thoughts related to personally relevant bases of self-esteem become unconsciously active. Individuals differ in the extent to which their self-worth hinges on success in specific behavioral domains (e.g., academic, professional, financial; Crocker & Luhtanen, 2003). Researchers should consider testing whether thoughts of personally relevant self-esteem contingencies spontaneously become active during the distal phase. One relevant study in this vein (Yaakobi, Mikulincer, & Shaver, 2014) showed that, among individuals with a strong history of secure interpersonal attachment, MS followed by a delay heightened the accessibility of parenthood-related terms (i.e., *baby, diapers, pacifier, cradle, pregnancy*). Because securely attached individuals have had a relationship history colored by value-conferring interpersonal experiences, it is possible this effect reflects increased unconscious focus on a domain (i.e., parenthood) which could reinforce self-esteem. It is also possible, however, that Yaakobi et al.'s (2014) finding instead reflects symbolic strivings for close relationships, which—independent of their self-esteem conferring and worldview-reinforcing effects—have sometimes been shown to serve terror management functions (e.g., Hart, Shaver, & Goldenberg, 2005; Hirschberger, Florian, & Mikulincer, 2003).

In the Distal Phase, Symbolic Defenses Reduce Death Thought Accessibility

During the distal phase, thoughts of death (and associated thoughts of meaning and value) start percolating in people's unconscious minds. Consequently, at the behavioral level individuals exhibit diverse efforts to defend faith in their worldview and strive for self-esteem. And the payoff? Engaging these defenses reduces DTA to baseline (i.e., pre-MS) levels. The initial existential scare provoked by MS gets quieted if individuals conceal it behind a symbolic veil of cultural significance and personal specialness.

For example, Arndt, Greenberg, Solomon, et al. (1997) had American college students think about death or, in a control condition, the unpleasant event of taking an exam. After a delay, mortality salient participants showed elevated DTA compared to exam salient participants. However, in a third condition, mortality salient participants had an opportunity to engage in worldview defense before completing the DTA measure (by exhibiting favoritism for the author of a pro-US essay over the author of an anti-US essay). Among mortality salient participants who received this opportunity

for defense, DTA was reduced to the same low level found in the exam salience condition.

Subsequent research (Greenberg, Arndt, Schimel, Pyszczynski, & Solomon, 2001) verified that reductions in DTA after MS-induced distal defense do not simply reflect reestablishment of the unconscious suppressive process observed at the proximal phase. Rather, worldview defense truly deactivates DTA. Recall that, immediately after MS, cognitive load inductions undermine the suppression of DTA and thus lead to DTA increases (Arndt, Greenberg, Solomon, et al., 1997; cf. Trafimow & Hughes, 2012). But after MS, a delay, and engaging in worldview defense, DTA remains low regardless of whether participants are mentally taxed by a cognitive load exercise (Greenberg et al., 2001). The function of distal defensive behavior is thus to effectively dissipate unconscious death concerns provoked by MS (not simply to re-suppress them).

Why does worldview defense provide this psychological security from death? According to TMT, worldviews outline paths toward a righteous and transcendent existence. When people defend their worldviews, they are asserting that their internalized view of reality qualifies them for literal or symbolic immortality—that their way of life is the special and uniquely human way, rather than that of damn dirty apes. Indeed, Vaes, Heflick, and Goldenberg (2010) found that, after explicit MS and a delay, individuals tended to rate stereotypical attributes of their in-group as uniquely human traits (rather than those with a clear animal heritage). Further, this MS-induced increase in perceived in-group humanness correlated negatively with DTA. People gained security from death by promoting the distinctive integrity of groups that embodied their immortalizing ideology.

Distal defensive responses are characterized by their relevance to participants' preexisting worldview. Sometimes this relevance is determined by individuals' cultural place and time. Certain historical periods are colored by cultural events that make the defense of identity particularly likely. For instance, in the wake of the September 11th 2001 terrorist attacks, terrified Americans leaned particularly heavily on symbols of patriotism. In that context, MS caused both liberal and conservative participants to exhibit amplified support for then-President George W. Bush and his antiterrorism policies (Landau et al., 2004). Similarly, with the emergence of the Islamic State, Americans living in the general vicinity of New York responded to MS with lessened support for the building of a mosque at the site of the 9/11 attacks (Ground Zero), and by increasing the distance from Ground Zero they felt was appropriate for the proposed mosque's location (Cohen, Soenke, Solomon, & Greenberg, 2013).

Direct evidence for the importance of personal relevance in distal effects comes from studies in which worldview defense is moderated by individual differences in personal beliefs. Rosenblatt et al. (1989) found that MS increased the bail bond participants recommended for a hypothetical

prostitute, but only among individuals with a preexisting moral opposition to prostitution. Analogous variation occurs with respect to stable personality differences. In a study by Greenberg et al. (1990), authoritarians—people who principally endorse uniform adoption of and obedience to societal rules and norms—responded to MS with pronounced rejection of someone who did not share their attitudes on various social issues (e.g., regarding the discipline of children, interest in sports, and the role of women in society). This effect did not occur among the people low in authoritarianism. Further, individual differences in group identification can alter the relevance of issues individuals seek to defend. As general support for the War in Iraq and President Bush waned, the effect of MS to enhance Americans' advocacy for antiterrorism tactics became limited to politically conservative people, not occurring among liberals (Pyszczynski et al., 2006). By contrast, liberals responded to MS with amplified support for various progressive positions (e.g., on stem cell research, same-sex marriage, welfare, reproductive rights; Castano et al., 2011).

The moderating role of personal relevance in distal effects is most strongly evinced by research on self-esteem striving. Individuals consistently respond to MS with intensified activity in behavioral domains that are relevant to their self-esteem, but not in self-esteem irrelevant domains. For example, at the distal phase, Arndt et al. (2003) observed MS to increase behavioral health intentions, but only among individuals who had indicated that being healthy is important to their self-esteem. Likewise, only people with pronounced self-esteem contingencies for their strength training ability responded to MS by squeezing a hand dynamometer more strongly (Peters, Greenberg, Williams, & Schneider, 2005), and only those whose self-worth was tied to their driving ability responded to MS with pronounced acceleration on a driving simulator (Taubman–Ben-Ari, Florian, & Mikulincer, 1999). Situationally induced self-esteem contingencies play a similar moderating role. When women were reminded of attractive tan female celebrities (Jennifer Lopez and Jennifer Aniston), MS increased their desire to get a tan; but if the highlighted celebrities were instead pale-skinned (Nicole Kidman and Gwyneth Paltrow), MS decreased tanning intentions (Cox et al., 2009).

Like worldview defense, self-esteem striving serves the critical, psychodynamic function of reducing MS-induced DTA. In research by Mikulincer and Florian (2002), participants performed a complex concept formation task, requiring them to solve geometric problems that were, in fact, unsolvable. The researchers varied whether participants received success or failure feedback, and then asked participants to explain why their performance turned out as it did. After MS, participants were more likely to give self-flattering responses: more strongly attributing good performance to internal, stable, and global aspects of themselves, and more weakly attributing poor performance to those factors. Getting the chance to make such self-serving causal attributions eliminated the effect of MS on DTA.

In sum, pursuing symbolic, personally relevant behavioral inroads to meaning and value functions to subdue unconscious death-related concerns that are otherwise provoked by MS.

THREAT-INDUCED DTA: ELICITING DEATH-RELATED THOUGHTS WITH THREATS OTHER THAN DEATH

Humans continuously rely on meaning and value to shield themselves from the terrifying knowledge of mortality. In this sense, worldview faith and self-esteem are essential for basic human functioning and survival. Yet, they also are fragile social constructions, and highly susceptible to threat. Beliefs can be falsified, and self-confidence undermined. In such instances, the mind's ability to keep death-related thoughts concealed behind the veil of daily life becomes compromised. Direct threats to the buffer—threats to the worldview, threats to self-esteem—can automatically trigger increases in DTA (*threat-induced DTA*). Here again, the psychodynamic nature of terror management processes is apparent. Consciously encountered threats, the contents of which may bear no overt connection to mortality, function to elicit unconscious thoughts of death. However, the psychodynamic nature of some threat-induced DTA effects remains in question.

Threats to the Worldview Increase Death Thought Accessibility

Research by Schimel, Hayes, Williams, and Jahrig (2007) endeavored to test whether DTA increases following threats to the worldview. In one of their studies, Canadian participants read an essay tarnishing the Canadian healthcare system, arguing that it is an utter failure ("If my appendix burst I would hope it could be taken care of with an efficiency greater than that found at the Post Office," p. 791). Control participants instead read a statement lambasting the Australian parliamentary system. Those in the anti-Canada condition exhibited higher DTA, on both word fragment and lexical decision measures. Illustrating specificity to death, the latter measure verified that the anti-Canada condition quickened reaction times in the identification of death-related words, but did not influence rates of identification for negative but nondeath-related words (i.e., *suffer*, *wrong*, *jerk*, *fight*, *fail*, *punish*).

However, Schimel et al.'s (2007) anti-Canada versus anti-Australia manipulation confounded nationality with death-relevance of the topic. Perhaps the DTA increase occurred not because of a worldview threat, but because thoughts of failed healthcare made people think about the literal prospect of death. Similar conundrums arise in related studies. Cohen et al. (2013) found that asking Americans to think about the building of a mosque in their neighborhood increased DTA, whereas asking them to imagine a church or synagogue did not. It could be, however, that mosque-building heightened DTA due to direct, semantic associations between Islam and the

threat of terrorism in the minds of Americans (rather than due to purely symbolic conflict among worldviews). Indeed, research has shown that primes of terrorism can function much like MS inductions (e.g., Landau et al., 2004; Pyszczynski et al., 2006). Results from Rutjens, van der Pligt, and van Harreveld (2009) are likewise susceptible to alternative explanation. Based on the idea that Western ideologies have historically been rooted in utopian ideas of progress and hope, Rutjens et al. (2009) hypothesized and found heightened DTA among Dutch participants who read a passage arguing that human progress is a myth. Yet, the key manipulation was confounded by the presence of death-related content. Whereas the progress-is-a-myth statement emphasized the persistence of war and disease despite scientific and technological advancement, the control condition essay made no mention of war and disease. It focused instead on annoyances in crowded public transportation contexts.

Do these worldview threat-induced DTA effects stem from undermined belief systems, or from semantic/conceptual ties between threat concepts? That question is still pending. As this literature develops, it will be important for researchers to test whether such effects occur after accounting for variance in literal, logical, semantic associations between the idea of mortality and concepts highlighted by threat inductions.

Some research appears to support the idea that threat-induced DTA is attributable to ideological challenge rather than direct cognitive priming. Cook, Cohen, and Solomon (2015) manipulated whether participants from a wide variety of religious backgrounds wrote about what atheism means to them. Other participants instead received MS or control questions. Consistent with the idea that atheism poses an existential-ideological threat to traditional theistic worldviews, thinking about atheism heightened theists' DTA to the same degree that MS did. It is not obvious that atheism should be semantically tied to death. Still though, it is possible that thinking about atheism made theists think directly and literally about the absence of life after death, rather than ideological conflict per se. Similarly, Schimel et al. (2007) observed adherents of creationism to exhibit heightened DTA after reviewing evidence from the fossil record for "*Ambulocetus* ... the very animal that creationists proclaimed impossible in theory" (p. 800). This effect may have occurred because the creationists' worldview was threatened, but may alternatively have stemmed from literal, explicitly provoked thoughts of a potential void after death.

Other work provides stronger support for the psychodynamic perspective. Studies show that, even when people are presented with stimuli that might bear semantic connections to death, threat-induced DTA effects are eliminated when ideological challenge is minimized. For instance, in the aforementioned work of Schimel et al. (2007), exposure to the anti-Canada essay heightened DTA in one study, yet this effect was eliminated in a second study when participants were told the essay's author had publicly renounced

his statements. According to the cognitive priming alternative, mere exposure to the anti-Canada essay (and its mention of healthcare issues) should generally activate death-related thoughts, regardless of its worldview-threatening nature. Yet, diffusing the threat diminished the effect, suggesting ideological challenge better explains the finding.

Similar results arise in studies examining threats to global beliefs about the natural order of things. For instance, people generally prefer to believe the world is a just place, where individuals get what they deserve and deserve what they get (Lerner, 1980). But sometimes, outcomes are unjust and thus threaten belief in meaningful universal balance. Hirschberger (2006) observed heightened DTA among participants who read about an unjust event, in which a careful driver suffered a horrific car accident. However, if the driver was instead characterized as reckless (making the outcome appear just), reading about the same car accident did not heighten DTA. Accordingly, the results likely reflected undermining of a worldview, rather than direct cognitive priming. Similarly, Roylance, Abeyta, Routledge, and Juhl (2014) observed that generating personal memories of unjust outcomes heightened DTA, but only among individuals with particularly pronounced preexisting just world beliefs.

Another way to globally undermine individuals' sense of significance is by reminding them of their limited, physical properties. The idea that people are defecating, fornicating, blood-pumping assemblages of temporarily animated meat is inconsistent with meaningful views of human existence. Individuals thus prefer to promote human nature over corporeality: to elevate themselves above the merely mortal and creaturely. And consequently, triggering thoughts of human creatureliness heightens DTA. For example, following reminders that humans and animals share many similar attributes, DTA has been shown to spontaneously increase in response to thoughts of sex acts (Goldenberg, Cox, Pyszczynski, Greenberg, & Solomon, 2002), disgust-eliciting stimuli (Cox, Goldenberg, Pyszczynski, & Weise, 2007), and engaging in the animalistic behavior of punching a punching bag (Motyl et al., 2013).

Threats to Self-Esteem Increase Death Thought Accessibility

Just as undermining worldview faith heightens DTA, so too does undermining self-esteem. The anxiety buffering nature of self-esteem is well-established (Becker, 1962; Greenberg et al., 1993), as are the negative affective consequences of threats to self-worth (e.g., Bennett & Holmes, 1975). Yet, self-esteem threat-induced DTA reflects a fairly subtle, unconscious consequence of undermining people's personalized cognitive barrier against death.

Hayes, Schimel, Faucher, and Williams (2008) provided compelling demonstrations of this phenomenon. In one study, participants with strong

preexisting self-esteem contingencies for intelligence completed an IQ test. One third of participants received contrived feedback indicating they performed well relative to other participants (in the 92nd percentile), a second third was told they did poorly (in the 35th percentile), and the final third received no feedback. Relative to the positive and no feedback conditions, participants told they did poorly exhibited faster lexical decision reaction times to death-related words (but not to frequency-matched negative and neutral words). Analogous findings occurred when participants received false feedback indicating their personality was incongruent with their career goals. This latter effect was conceptually replicated in recent work by Yaakobi (2015), who observed heightened DTA among individuals directed to imagine having trouble finding a job.

Similar effects occur when participants generate their own self-esteem threats. Ogilvie, Cohen, and Solomon (2008) randomly assigned participants to write about death, pain, desirable aspects of themselves, or undesirable aspects of themselves. Relative to the pain and desirable self-conditions, thinking about the undesired self-increased DTA to the same degree that the death reminder did. This outcome helps explain why, in a subsequent study, Ogilvie et al. (2008) found both MS and thinking about the undesired self to increase American participants' support for then-President George W. Bush and his policies in Iraq.

Compared to most worldview threat studies, self-esteem threat studies provide clearer support for the psychodynamic nature of threat-induced DTA. Self-relevant threats in domains with no obvious logical or semantic connections to death (e.g., intelligence) precipitate spontaneous increases in DTA. This should guide interpretation of related studies in which semantic priming appears to present an alternative explanation. For example, Yaakobi et al. (2014) found increased DTA among securely attached individuals if they were induced to imagine not being able to have children due to infertility problems. Perhaps DTA increased because thoughts of offspring are semantically linked to life-and-death processes. Yet, in the context of the broader body of work, this result is more likely attributable to self-esteem threat. Securely attached people have a developmental history in which self-esteem is positively bound to the process of cultivating parent-child relations, and infertility undermines that inroad to personal value.

Threats to Close Relationships Increase Death Thought Accessibility

While TMT stresses the death anxiety buffering function of worldviews and self-esteem, it has also been argued that close relationships serve a comparable death-denying function (e.g., Hart et al., 2005). Throughout the life span, the attachments people form with close others can provide an essential

source of ease (e.g., Bretherton, 1985). As children, consistent, nurturing parental contact imprints a literal association between interpersonal connection and psychological equanimity. As adults, such processes transfer to symbolic forms of security that have been shown to serve terror management functions. Many studies have shown that MS instigates efforts to seek emotional and physical closeness to others (for a review, see Mikulincer, Florian, & Hirschberger, 2003).

Conversely, stripping people of secure relational ties has the potential to unleash implicit death-related thoughts. DTA has been shown to escalate when people contemplate their fears of intimacy (Taubman–Ben-Ari, 2004) and problems in their current romantic relationship (Florian, Mikulincer, & Hirschberger, 2002). These effects stem from concerns with being cleaved from close others in lasting, impactful ways. Mikulincer, Florian, Birnbaum, and Malishkevich (2002) found that thoughts of short-term separation from a relationship partner did not heighten DTA, whereas thoughts of long-term or final separations did. Similarly, DTA was elevated among first-time mothers induced to think about separation from their newborn infants (Taubman–Ben-Ari & Katz-Ben-Ami, 2008).

In sum, various forms of symbolic threat can undermine the terror management system, triggering spontaneous increases in subconscious preoccupation with the problem of death.

STRENGTHENING THE BUFFER REDUCES DEATH THOUGHT ACCESSIBILITY AND DEFENSIVENESS

If undermining self-esteem and worldview faith elicits existential threat, then conversely, reinforcing those psychological structures should insulate people from such concerns. Consistent with this proposition, bolstering meaning and value has been shown to buffer people from the effects of mortality reminders.

Harmon-Jones et al. (1997) provided initial support for this hypothesis. Their American participants received made-up personality feedback, supposedly based on their responses on earlier surveys. For half of participants, the feedback was quite positive, intended to momentarily boost self-esteem; for the others, the feedback was neutral. Participants in the neutral feedback condition exhibited standard effects of MS + delay to amplify DTA and pro-US bias, yet these effects were eliminated in the positive feedback condition. Analogously, situational boosts to self-esteem eliminate MS-induced self-esteem striving. Recall Taubman—Ben–Ari et al.'s (1999) finding that, among people with strong self-esteem contingencies for driving, MS led to reckless acceleration on a driving simulator. Yet, this effect was eliminated if participants received feedback that they had done a good job during initial driving trials.

TMT suggests that the buffering function of heightened self-esteem stems from individuals' securing sense that they are meeting or exceeding personally relevant goals. Consistent with that idea, distal defenses dissipate when individuals imagine personal successes. For instance, having Israeli participants imagine they had been hired for a highly desired job reduced effects of MS on DTA, and on derogation of Israeli-Arabs (Yaakobi, 2015). Likewise, among individuals with strong goals for creative success, MS heightened DTA unless those individuals believed they had achieved their creative goals (e.g., in the visual arts, music, inventing; Perach & Wisman, 2016). In the context of relationships, MS-induced DTA was eliminated when people first imagined being with their romantic partner during a time when they "made you feel good about yourself" (Cox & Arndt, 2012, p. 622), as well as when securely attached people imagined the successful birth of their child (Yaakobi et al., 2014).

According to TMT, goal-directed successes provide psychological security because they reinforce a sense of personal heroism and corresponding prospects of immortality. Indeed, in a recent study by McCabe, Carpenter, and Arndt (2016), associations between heroism and the self buffered people from the effects of MS. Participants read a news article about an individual who had heroically saved a baby from a burning building, sustaining injuries in the process and establishing a legacy for years due to this heroic act. The researchers manipulated whether the hero's birthday was or was not the same as the participants', thereby varying whether participants could sense a connection between their own identity and that of the hero. Without sharing the hero's identity, MS heightened DTA; but in the shared identity condition, this effect was eliminated. Similar effects occur at the behavioral level. McCabe, Carpenter, and Arndt (2015) found that MS-induced DTA was eliminated among participants who, upon performing a cold pressor task (submerging their arm in $\sim$40°F water for up to 4 minutes), were told their level of pain endurance met standards for the heroic personality. In fact, MS participants who received the heroism feedback reported the task to be less physically painful.

Ultimately, heroism alleviates death concerns because it implies the prospect of immortality. Consequently, bolstering individuals' sense of personal continuance beyond death buffers them from the effects of MS. For example, Wojtkowiak and Rutjens (2011) were able to eliminate MS-induced DTA by having participants imagine their after-death reputation (i.e., the reputation they would like to have once they are gone and how they want to be remembered in the memories and thoughts of others). This illustrates the buffering function of symbolic continuance. Related work by Dechesne et al. (2003) showed that reinforced belief in literal immortality is similarly securing. They observed MS to increase the perceived accuracy of fake positive personality feedback, unless participants were first presented with convincing scientific evidence for the existence of life after death.

Sustaining belief in cosmic heroism and immortality helps individuals feel elevated above their finite, limited, animal nature. Likewise, ensuring a psychological demarcation between humanity and creatureliness helps insulate people from the effects of MS. MS-induced DTA and worldview defense are eliminated by presenting people with arguments reinforcing the difference between humans and other animals (Cox et al., 2007), or the uniquely enduring nature of human progress (Rutjens et al., 2009). Cohen, Sullivan, Solomon, Greenberg, and Ogilvie (2011) poignantly illustrated the securing function of psychologically transcending the body. They observed a standard effect of explicit MS + delay to heighten DTA. But, in one condition, individuals first spent a few minutes imagining they were flying. Doing so led those participants to experience a heightened subjective sense of freedom from bodily limitations, which, in turn, completely eliminated the effect of MS on DTA.

Buffering against MS effects also results when individuals experience reinforcement of their cultural worldview. For instance, Schmeichel and Martens (2005) found that having participants write a brief essay about their most important value—a procedure termed *self-affirmation*—eliminated MS-induced worldview defense and DTA. However, the effectiveness of affirmation-based buffering likely depends on whether an individual's worldview is rooted in intrinsic, personalized bases of meaning and value, as opposed to extrinsic, socially contingent bases. Intrinsic value systems are positively associated with well-being and psychological stability, while extrinsic worldviews are associated with psychological and physical unrest (e.g., Kasser & Ryan, 1993). In fact, Jonas and Fischer (2006) observed that intrinsic worldviews buffer MS effects in ways that extrinsic worldviews do not. Specifically, they observed MS to amplify German participants' preference for the author of an essay praising the city of Munich over the author of an anti-Munich essay. However, in an affirmation condition, participants first received an opportunity to express their intrinsic and extrinsic ties to religion. Affirmation did not diminish defensiveness among extrinsically religious individuals; yet, among intrinsically religious people, affirmation eliminated MS-induced worldview defense and DTA.

Worldview-reinforcing cues have also been shown to reduce threat-induced DTA. Hayes, Schimel, Faucher, et al. (2008) observed heightened DTA among participants led to think they were about to give an ill-prepared speech in front of their peers (a 376-word essay on how to classify volcanoes). Yet that effect was eliminated if participants first had a chance to self-affirm. That outcome was fairly optimistic and prosocial. Sometimes, though, the security attained via worldview fortification takes socially aversive form, entailing the humiliation or destruction of out-group members. For instance, Hayes, Schimel, and Williams (2008) observed elevated DTA among Christian participants who read about Muslim occupation of the city of Nazareth (vs a nonthreatening control article about the aurora borealis).

However, this effect was eliminated if the threatened Christians also read that a number of Muslims had died in a plane crash on their way to Nazareth. Cohen et al. (2013) observed similar DTA reduction among Americans who read about the desecration of the Quran.

Fortunately, there are more positive and manageable ways of fortifying a securing sense of life's meaningfulness. Recent studies have tested the defense-allaying properties of *nostalgic thinking*: focusing on meaningful past life experiences. Using nostalgia to easily access internal reservoirs of meaning reflects a desirable alternative to more socially aversive forms of worldview reinforcement. And it seems to work. Routledge, Arndt, Sedikides, and Wildschut (2008) found that having individuals engage in nostalgic remembrance eliminated MS-induced DTA. Routledge, Juhl, Abeyta, and Roylance (2014) further showed that nostalgia may be a good way to reroute defensive urges away from dire social behavior. Individuals with high dispositional levels of DTA were particularly likely to endorse religious self-sacrifice (e.g., dying for their religion), unless they spent a few minutes thinking nostalgically.

Routledge et al.'s (2014) work illustrates the merit of measuring dispositional levels of DTA, a tactic that researchers have only recently begun to employ. Individual differences in baseline DTA might be interpreted as indicators of the chronic strength/weakness of terror management systems. Consistent with this view, Routledge et al. (2010) found that, among individuals with low self-esteem, greater baseline DTA was associated with perceiving less global meaning in life. Additional evidence suggests such deficits may contribute to compensatory behaviors aimed at restoring self-integrity. Cooper, Goldenberg, and Arndt (2011) studied women at a mammography clinic, finding that women with higher dispositional DTA reported increased intentions to engage in breast self-examination if that activity was framed as an empowering step toward taking control of their health. Yet, in the absence of opportunities to restore the buffer, chronic high DTA precipitates problematic psychological outcomes. Traumatized individuals struggle to suppress DTA, and respond to MS with heightened negative affect rather than worldview defense or self-esteem striving (e.g., Edmondson et al., 2011). Similarly, compared to mothers of typically developing children, mothers of children diagnosed with autism spectrum disorder exhibited pronounced DTA, which statistically explained their elevated rates of depression and anxiety (Cox, Eaton, Ekas, & Van Enkevort, 2015).

In sum, strengthened senses of meaning and value function psychologically to buffer individuals from reminders of their mortality. In instances where situational or dispositional factors engender deeply felt symbolic security, MS is unlikely to provoke DTA and distal defenses. Conversely, weakening those structures increases the potential for defensiveness and distress.

WHAT IS DEATH THOUGHT ACCESSIBILITY?

This chapter has illustrated the pivotal and multifaceted role played by DTA at all phases of the TMT dual-process defense model. It is important next to step back and lend deep consideration to the significance of this construct. What is DTA? Understanding the meaning of this phenomenon requires entertaining a basic question: if TMT focuses on the terror of death, and DTA is the primary psychological mechanism by which associated findings arise, is DTA thus an index of being emotionally terrified?

While this is an appealing syllogism, the DTA construct is not so intuitive. It is well-documented that, in the vast majority of TMT studies, MS does not influence subjective indices of momentary affective experience. In rare instances where MS does influence self-report (e.g., Lambert et al., 2014) or physiological (e.g., Arndt, Allen, & Greenberg, 2001) affective measures, the effects are typically transient and do not mediate standard distal defensive responses. In the even more rare cases where signs of such mediation do occur, this has typically been qualified by complex interactions of MS with individual differences (e.g., Routledge et al., 2010). The role of affect in terror management processes is complicated; but, given that MS influences DTA in varied ways while typically leaving affective measures unaltered, it seems inaccurate to interpret DTA as an index of immediate affective experience.

The preferred manner of characterizing DTA points to its role as a cognitive warning signal of the *potential* to experience negative affect. As proposed by Solomon, Greenberg, and Pyszczynski (1991), over the course of development, humans learn to avoid conscious exposure to death-related anxiety by relying on faith in a cultural worldview and self-esteem. Such structures would not buffer existential anxiety particularly effectively if the full wellspring of an individual's death-related terror erupted every time mortality became salient. Rather, TMT contends that humans have an efficient cognitive-behavioral system in place to mitigate existential concerns before they consciously overwhelm us. A key part of that system manifests when, in response to MS, death-related thoughts are potentiated outside of focal awareness and signal the need to employ distal defenses. It is in this sense that DTA likely indexes heightened potential for death-related anxiety. By way of analogy, a silent alarm warns security personnel to marshal resources and stymie a potential bank robbery, but does so without causing overt panic at the bank.

Evidence supporting this analysis shows that distal MS effects run their course, in part, because people fear the prospect of becoming anxious. This was nicely illustrated in a study by Greenberg et al. (2003). Before receiving a standard MS + delay treatment, American participants drank a tea purported either to have anxiety-blocking or memory-enhancing effects. MS-induced pro-US bias was observed in the memory-enhancer placebo

condition, yet the MS effect was eliminated if the placebo was said to be an anxiety-blocker. This suggests DTA and concerns with potential anxiety simultaneously play a mediating role in MS effects, and may therefore be related or perhaps overlapping constructs.

Importantly, DTA has been shown statistically to mediate the effect of MS on worldview defense, independent of state-based emotion. For instance, Vail, Arndt, Motyl, and Pyszczynski (2012) found that presenting images of destroyed buildings (vs images of construction sites or intact buildings) increased lexical decision reaction times to death-related words (while leaving reaction times to war and national identity words unchanged). Further, without altering participants' subjectively reported affect, the effect of destroyed building salience to increase DTA fully mediated increased support for pro-military attitudes (e.g., endorsing that the only way of stopping international terrorism is if the United States follows an uncompromising warlike approach).

In parallel with this compelling mediational evidence, it is important to consider factors that moderate the effectiveness of DTA in instigating effective terror management. Recent work suggests that individuals differ in how adaptively they utilize the subtle signaling function that DTA has evolved to provide. Whereas DTA bears no association with momentary affective experience among high self-esteem individuals, people with low self-esteem show a positive association between DTA and subjective indices of negative affect (Routledge et al., 2010). This suggests that effectively managing existential terror via reliance on subtle cognitive cues of potential anxiety may be possible for people with robust terror management capacities; but, for those in whom such capacities are suboptimal, potential anxiety can bubble over into conscious experiences of unrest. This account is consistent with additional evidence that, among relatively unbuffered people, MS compromises well-being and increases negative affective states when measured distally (Juhl & Routledge, 2016).

It is necessary to distinguish the role of affect in typically subtle MS effects from the role of affect in studies of threat-induced DTA. As recently discovered by Webber et al. (2015), it appears that threat-induced DTA is partly fueled by hot-blooded emotions elicited by the encountered threat. In their work, having Protestant Christians read an article claiming that biblical accounts of Jesus' life were plagiarized triggered both increased DTA and increased worldview defense (i.e., punitiveness toward a hypothetical prostitute). However, before the dependent measures, participants drank a placebo tea. In the experimental condition, the tea was said to contain caffeine that would make participants feel jumpy, increasing heartrate and jitteriness; in the control condition, the tea was said to contain a vitamin supplement and no side-effects were mentioned. Consistent with the idea that actual emotion contributes to threat-induced DTA, defensive outcomes occurred in the

vitamin condition but not in the caffeine placebo condition. Misattributing threat-induced affect to the fake caffeine stimulation eliminated threat-induced DTA and worldview defense. Similarly, Webber et al. (2015) found that exposure to disgusting stimuli (e.g., a dirty toilet or bloody finger) heightened DTA unless participants were encouraged to interpret the gross stimuli in a detached and unemotional way.

Further support for a dissociation between the processes in typical MS studies and those employing other threats comes from a recent metaanalysis (Steinman & Updegraff, 2015). As it turns out, effects of explicit MS on DTA grow stronger as the length of the post-MS delay and the number of distractor tasks increase, whereas threat-induced DTA effects become smaller with longer delay length and more distractor tasks. This suggests that threat-induced DTA studies examine compensation for DTA in conjunction with hot emotional processes that fade over time (like anger or disgust), whereas typical MS effects reflect the operation of cooler cognitive processes that strengthen over time as unconscious awareness of the need for terror management persists (like a subtle hunger). While similar compensatory responses emerge from distinct threat inductions, the magnitudes of such responses vary along inversely related time-courses.

In sum, DTA plays a central role in the dual-process model of terror management. Evidence suggests DTA most likely indicates elevated unconscious awareness of the potential to experience anxiety. However, DTA may covary with hot affective processes in the context of some existential encounters. Future research should directly examine how different threats influence relationships between DTA and potential or actual emotion.

CONCLUSION

Decades of research on the dual-process terror management system have revealed a complex series of processes by which humans protect themselves from the haunting awareness of mortality. Myriad mental gymnastics keep death-related anxiety stowed away in dark recesses of the unconscious, allowing people to go about their day-to-day lives seemingly untouched by ever-lingering thoughts of their demise. When environmental factors subtly remind individuals of the unwelcome news that they will someday perish, the mind first pushes death cognitions away, via suppression, rationalization, and distraction. Residual terror then gets processed as a mere subconscious flicker—one that is extinguished through heroic-yet-defensive strivings for symbolic meaning and value. Research continually reveals nuances in these processes, illustrating the profoundly psychodynamic nature of human efforts to cope with the existential condition.

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Chapter 3

What's Death Got to Do With It? Controversies and Alternative Theories

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> *First, you know, a new theory is attacked as absurd; then it is admitted to be true, but obvious and insignificant; finally it is seen to be so important that its adversaries claim that they themselves discovered it.*
>
> James (1907)

If the natural reaction to a new scientific theory is skepticism, which can only be seen as right and proper, a theory's worth is measured not only by the known observations it can accommodate but also by its ability to generate new observations and withstand repeated attempts to invalidate it over time. Among psychological theories, terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) certainly aroused great skepticism at its inception, and three decades later it has generated an impressive body of data. The theory endures, but it continues to attract controversy.

At least, the terrain on which disagreements with TMT play out is now clearly demarcated. Namely, critics still regularly challenge TMT's provocative central claim, that people's adherence to specific belief systems (i.e., *cultural worldviews*) and desire to view themselves as personally valuable (i.e., *self-esteem*) reflect efforts to defend against death anxiety. Hardly anybody disagrees that people are drawn to worldviews that imbue reality with meaning and structure, or that they want to view themselves as good and worthy denizens of the world—or even that raising concerns about death *causes* people to "defend" their beliefs and self-esteem. Instead, the controversy has been and is still centered on whether death concerns, per se, are at the root of worldview and self-esteem dynamics, or are simply an example of the kind of psychological threats that elicit behaviors seemingly oriented toward preventing or managing anxiety.

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In this chapter, I present an overview and evaluation of theoretical alternatives to TMT and some of the methodological and conceptual challenges and controversies raised by research inspired by both TMT and the alternative theories.

OBSERVATIONS TO BE EXPLAINED: WHO NEEDS TERROR MANAGEMENT?

TMT was originally proffered as a relatively parsimonious explanation for two human tendencies that social psychologists had highlighted for decades: the need for self-esteem and the persistent difficulty that people have dealing with people different from themselves (e.g., out-group members; Tajfel, 1982). Psychologists had found these two tendencies to be related—for example, people derive self-esteem from their group affiliations, so they are motivated to create positive distinctions between the in-group and the out-group, leading to unfriendly behavior designed to enhance the in-group's (and by extension, one's own) perceived value at the expense of the out-group (Tajfel & Turner, 1979). However, no contemporary theory adequately addressed the question of why we need self-esteem to begin with.

Drawing largely from Ernest Becker's (e.g., 1973) work, TMT posits that, among animals, humans' psychological proclivities are uniquely shaped by the awareness of and aversion to death.[1] Self-esteem helps people transcend the limitations of mortality by reflecting potency, purpose, or personal value that will endure beyond their literal death. Other people—that is, one's cultural cohorts—serve as the basis of this *symbolic immortality*, in that one "lives on" in the memories of others, through one's contributions to society, through one's offspring, and so on. And yet, this abstract version of immortality depends on a culturally shared interpretation of reality that confers value on being a certain kind of person who does certain kinds of things. Hence, other people in one's group and the values they share are integral to self-esteem's effectiveness as a means of coping with mortality.

This helps to explain people's difficulty getting along with out-groups: by definition, the out-group represents a different cultural conception of reality that threatens to undermine the perceived validity of one's own; disparaging out-group members is a way of affirming one's own cultural values. Moreover, cultural conceptions of reality generally appeal to people's desire to transcend death by depicting the world as a benevolent, orderly, predictable place. This kind of conceptual structure gives order to chaos and generally contributes to the sense of "rightness" in the world.

1. Other animals are averse to physical threats; and some are likely self-aware, but humans are the only ones we are certain are necessarily aware of their own inevitable mortality and about the various implications pertaining to that awareness.

In sum, each person knows that he or she will die one day, which is an emotionally catastrophic realization for an animal because knowledge of inevitable death disrupts and undermines the many motivational processes that support self-preservation. Individuals cope with death awareness—thereby defusing a potentially debilitating psychological threat—by striving to be valuable members of a meaningful reality. The apotheosis of these dynamics can be seen in the great religions of the modern world, which offer not only symbolic but also literal immortality—an afterlife—to those who live up to the standards prescribed by religious traditions.

It follows that TMT has the ability to explain a great diversity of human behavior and psychology. Practically everything that people strive for can be construed as either directly supporting continued life (e.g., eating, avoiding injury, etc.) or indirectly supporting symbolic immortality: the pursuit of self-esteem and/or meaning. Why do people pursue meaningful work, to excel at what they do relative to others, to drive nice cars, wear attractive clothing or maintain nice homes, read self-help books, go to church, or push their children to be high achievers? Self-esteem and meaning can—in principle—explain all of this, so to the extent that TMT explains the pursuit of self-esteem and meaning, it is a powerful theory, indeed.

FROM THEORY TO DATA

In short, TMT is conceptually appealing because it potentially explains a wide range of psychological phenomena in a rather parsimonious way. Critically, TMT also provides a scientific paradigm for testing its propositions via its *mortality salience* (MS) and *anxiety-buffer* hypotheses. The MS hypothesis states that if self-esteem and worldviews compensate for existential insecurity, then reminding people of the source of that insecurity—death—should increase efforts to protect or augment self-esteem and worldviews. In a complementary fashion, the anxiety-buffer hypothesis states that if self-esteem and worldviews protect against death anxiety, then bolstering them should make people more psychologically resilient, whereas threatening them should make people vulnerable. (A later-derived prediction, the death-thought-accessibility (DTA) hypothesis, states that if death concerns are the underlying process mediating self-esteem and worldview dynamics, then threats to either should increase the ease with which death thoughts are brought to mind.)

As covered in Chapter 1 of this volume, all three hypotheses have received impressive empirical support. Terror management research has focused predominantly on the MS hypothesis, with experiments in which participants are randomly assigned to respond to two open-ended questions about their own mortality or another topic, before a delay-and-distraction task (typically, a mood report) and then an outcome measure. Sometimes, a moderator variable (e.g., gender or personality traits) is included and found

to interact with MS in affecting the outcome. A review of 277 such experiments found robust support for TMT, and suggested that death is "... a qualitatively unique threat" (Burke, Martens, & Faucher, 2010, p. 186).

Meanwhile, a review of research testing the DTA hypothesis found that threats to worldviews or self-esteem increase DTA (Hayes, Schimel, Arndt, & Faucher, 2010). These and other DTA findings lend impressive support to TMT's central hypotheses.

However, most empirical findings can be interpreted in more than one way, and that is true of many findings generated by TMT research. In general, research testing TMT's three main formal hypotheses is prone to two points of criticism. The first is that MS effects might be attributed to something that MS represents or instills (e.g., negative emotion), rather than death per se. The second is that measures of DTA are unreliable or invalid. Theoretical approaches that have sought to reinterpret TMT research findings in alternative ways have generally focused on the first (although in some ways the second is closer to the heart of the matter—more on that later).

Early in the theory's history, TMT researchers strove to rule out the possibility that MS effects could be due to (1) something like negative affect (e.g., anxiety, fear, or sadness) or (2) some other characteristic about death, such as the fact that it is universal, inevitable, and involves a "future concern." One way they did this was to simply measure self-reported affect and to show that, ironically, MS itself did not cause changes in affective state, seemingly eliminating the likelihood that just any aversive topic would produce parallel effects.[2] Another way was to devise control conditions that would pit MS against other aversive, universal, and (sometimes) inevitable or future-oriented topics, for example, dental pain or academic exams (e.g., Greenberg et al., 1995).

The results of TMT studies in this vein seemed to suggest not only that MS effects were not due to simple "mood repair"—that is, responding to a negative topic with efforts to improve one's mood—but also that the effects were exclusive to the topic of death; other aversive topics consistently failed to generate the same self-esteem striving and worldview defense. However, this conclusion is problematic for a number of reasons. For one thing, it implies that death awareness is the only (negative) stimulus that elicits self-

2. Although many studies have replicated the null effect of MS on subsequent self-reports of mood, Lambert et al. (2014) challenged TMT's claim that MS-related affect is immediately or preemptively suppressed, on both conceptual and methodological grounds. In particular, they noted that the richly emotional subjective experience that potentially accompanies MS and is likely expressed in participants' written narratives about MS has yet to be adequately plumbed. Furthermore, they provided evidence that self-reports of mood can, at least, detect an increase in *fear* (specifically) after MS, as compared to a neutral control condition. Clearly, more work is needed on this topic, although given that other negative topics beside mortality have now been found to elicit defensiveness, the more trenchant implications of disconfirming TMT's "affect-free" claim have already been realized.

esteem striving and worldview defense, but TMT itself acknowledges that mortality concerns are only part of the explanation for humans' need for self-esteem and meaning. Second, and more importantly, the finding that other motivationally relevant negative topics do not produce "terror management effects" violates TMT's own internal logic.

Here's why, according to TMT's anxiety-buffer and DTA hypotheses, any threats to either self-esteem or worldviews should raise DTA, and according to TMT's MS hypothesis, increased DTA should elicit terror management defenses. Because pondering the possibility of failing an academic exam would seem to threaten self-esteem, then it should also produce terror management effects.

Validating this view, studies show, for example, that threats to self-esteem resulting from a failure experience increase derogation of an outgroup member (e.g., Fein & Spencer, 1997); conversely, worldview threats (i.e., via a cognitive dissonance induction) increase self-affirmation tendencies (e.g., Tesser, Crepaz, Collins, Cornell, & Beach, 2000). Such findings certainly muddy the waters, but they also raise the possibility of reinterpreting the findings of TMT studies that by the late 1990s numbered in the several dozens (Pyszczynski, Greenberg, & Solomon, 1999).

ALTERNATIVE PERSPECTIVES: OVERVIEW

> *Whenever a theory appears to you as the only possible one, take this as a sign that you have neither understood the theory nor the problem which it was intended to solve.*
>
> Popper (1972, p. 266)

As TMT developed and began to amass empirical support, it took position alongside other influential mainstream theories, evidenced most clearly in 1997 with the publication of both a chapter in *Advances in Experimental Social Psychology* (Greenberg, Solomon, & Pyszczynski, 1997) and a target article in *Psychological Inquiry* (Pyszczynski, Greenberg, & Solomon, 1997). The latter stimulated challenging commentaries, some of which foreshadowed more fully developed critiques that would follow in the next decade. For example, Snyder's (1997) commentary argued that TMT would be more parsimonious if it were reconceptualized such that instead of death anxiety, the desire for *control* over desired outcomes was posited to be behind the effects seen in TMT studies. In other words, MS undermines people's sense of control, and therefore subsequent efforts to affirm worldviews or self-esteem could be seen as attempts to regain control. Similarly, Pelham (1997) suggested the possibility of a generalized anxiety-maintenance system whose operation happened to be most strongly stimulated by death as opposed to comparatively benign control topics.

Several years later, Van den Bos and Miedema (2000), Van den Bos (2001), and McGregor, Zanna, Holmes, and Spencer (2001) reported that *uncertainty* salience caused similar worldview defenses as did MS. This led McGregor et al. to suggest that the experience of personal uncertainty might be an active ingredient in MS effects.

These were among the first empirical findings to imply that at least some MS effects were not unique to MS. Around the same time, another important development occurred when Mikulincer and colleagues began to integrate TMT and attachment theory, arguing that close relationships should be considered to be a third, partially independent terror management mechanism in addition to self-esteem and worldviews (see Mikulincer, Florian, & Hirschberger, 2003, for a review). According to their reasoning, close (attachment) relationships function as individuals' first defense against the terror of mortality; self-esteem and worldviews follow. Close relationships, they argued, buffer existential concerns in symbolic ways: they provide people with a sense of continuity and lastingness (i.e., symbolic immortality), in that they will "live on" in the minds of those to whom they are connected; and they symbolically expand people's sense of self through a mechanism of identification with another person.

One important source of support for adding attachment to TMT was a series of studies by Florian, Mikulincer, and Hirschberger (2002), who found that MS (but not thoughts of physical pain) led participants to increase their level of commitment to their close relationships' partners, consistent with the MS hypothesis. Consistent with the anxiety-buffer hypothesis, they also found that contemplating relationship commitment eliminated people's engagement in worldview defense after MS. And, aligning with TMT's DTA hypothesis, thoughts of relationship problems and separation increased people's DTA.

Mikulincer et al. (2003) argued that the symbolic self-transcendence mechanisms underlying close relationships' effectiveness as death anxiety buffers are largely culturally invariant, suggesting they are, to a degree, distinct from TMT's cultural worldview mechanism. They also appear to be partially independent from self-esteem, because people have been found to increase their desire for relationship commitment after MS even when their relationship partner is imagined to pose a self-esteem threat by being critical (Hirschberger, Florian, & Mikulincer, 2003).

Together, the suggested addition of close relationships to TMT and the finding that threats other than MS could elicit worldview defense fueled the view that the defensive processes revealed by TMT research were more fluid than originally thought, perhaps pointing to a more general anxiety-maintenance process. In 2005 and 2006, three alternative perspectives were formally proposed espousing different versions of this view. One, the security system model (Hart, Shaver, & Goldenberg, 2005) built on Mikulincer and colleagues' integration of TMT and attachment theory, arguing on the

basis of TMT's own tenets and hypotheses that threats to any one terror management mechanism should cause defensiveness on the part of the other (unthreatened) mechanisms. Another, the meaning maintenance model (MMM; Heine, Proulx, & Vohs, 2006) asserted that instead of death, it is disruptions to *meaning* that cause people to defend themselves—in this view, self-esteem and worldview defense are seen as attempts to restore meaning. Finally, McGregor (2006) argued that MS is an example of a "poignant self-threat" that people construe as a goal disruption, which, in turn, instigates "offensive" defensive responses—efforts to re-engage behavioral approach systems in times of threat in order to alleviate discomfort or anxiety.

The three alternative perspectives represented different kinds of stance toward TMT. The security system model, essentially agnostic as to whether death should be considered the "worm at the core" of defensive processes, was the most conservative. Based on the TMT's own conjecture about the development of terror management, we (Hart et al., 2005) thought that the psychological defenses observed in TMT studies on young–adult participants represented a developmental elaboration of a structurally and functionally similar, albeit more simplistic, process of emotion regulation controlled by the attachment system in early childhood, well before the development of death awareness. The point of the model was to highlight the insights of an attachment theory analysis, to reorient the study of psychological defense around the concept of psychological security and insecurity (i.e., not just death concerns), and to emphasize the interconnectedness and interchangeability of different kinds of threat and defense.

By contrast, the MMM sought to radically reinterpret TMT's body of evidence, if not to supplant TMT entirely. According to the MMM, people strive to satisfy a master motive to maintain mental models of the expected relations (i.e., associations) between concepts—here, meaning is defined as such associations. Hence, meaning comprises all knowledge, both major and minor, that a person has about the world, but also provisional beliefs, personal memories, expectations about future events, and so on. Information inconsistent with one's knowledge networks disrupts meaning, is appraised as threatening, and prompts a person to attempt to restore meaning either in the relevant semantic domain or in another, unrelated one. This compensatory meaning restoration is referred to as *fluid compensation* (Allport, 1943), in the sense that the compensatory dynamics are not compartmentalized but can flow among many different domains.

McGregor's (2006) view (see also McGregor, Nash, Mann, & Phills, 2010; Nash, McGregor, & Prentice, 2011) also offered a parsimonious reinterpretation of TMT data, and subjugated the role of death concerns in its analysis of psychological defense. Now dubbed the reactive approach motivation (RAM) model, it points not to meaning but to uncertainty stemming from goal conflict as the psychological threat that people respond to with compensatory defensive efforts. Like the security system model and the

MMM, it, too, emphasizes fluid compensation processes. The RAM perspective also offers a potentially generative account of the biological (i.e., neurological) underpinnings of defense; similar to the security system model, it posits that newer, symbolic defenses are built upon ancient architecture, including behavioral approach and avoidance systems (Gray & McNaughton, 2000), that mediate physical self-protection.

ALTERNATIVE PERSPECTIVES: FINDINGS AND CONTROVERSIES

In sum, by TMT's 20th birthday, at least three alternative formulations had been formally advanced, with empirical evidence to support them. More have sprung up since then, and a truly comprehensive description of them all would be beyond this chapter's scope. In order to describe and evaluate them, then, I will group them based on central commonalities (see also Hart, 2014). In general, the theories can be considered to be *relational*, *self-focused*, *epistemic*, or *domain-general*. In the following sections I describe each approach in additional detail, while addressing pertinent empirical results and conceptual strengths and weaknesses.

RELATIONAL PERSPECTIVES

Although no single theory focusing on the psychological dynamics involved in close relationships has been offered as a full alternative to TMT, one could certainly be derived. To wit, several prominent theories can be used to generate many of the same predictions as does TMT. For one, sociometer theory (e.g., Leary & Baumeister, 2000), which views self-esteem as an internal gauge of social standing that alerts people to the need to improve their standing, is consistent with TMT findings that MS increases worldview defense and self-esteem striving. From a sociometer perspective, MS likely represents a threat to belongingness (because death is the end of social relationships), which should increase not only people's desire for self-esteem, but also their desire to affirm the shared beliefs that connect them to others in their social group(s). Sociometer theory could also predict, in principle, the finding that threats to self-esteem, worldviews, or relationships increase DTA (Florian et al., 2002), because from an evolutionary perspective, social exclusion is literally an existential threat, or at least it would have been in environments of evolutionary adaptedness. According to sociometer theory, a threat to self-esteem is an indicator of potential social exclusion (as, obviously, would be a relationship threat); and a threat to worldviews might subtly undermine a person's sense of being part of a cohesive social unit.

Along similar lines, Navarrete, Kurzban, Fessler, and Kirkpatrick (2004) argued that self-esteem striving and worldview defense in response to MS represent adaptive efforts to establish or maintain social connectedness

during times of existential threat. That is, when people feel threatened, it is to their advantage to seek social support, which could be accomplished directly or indirectly through ingratiation, coalition building, or increasing one's social status. Again, from an evolutionary perspective this makes quite a bit of sense and does not require one to invoke elaborate defense mechanisms.

It is difficult to rebut the central thrust of a relationally centered analysis, but one way in which it falls short is its inability to explain many empirical facts consistent with TMT's hypotheses, including the cross-cultural ubiquity of worldviews with particular, palliative content—belief in a just world (Lerner, 1980; why not belief in an *un*just world?), belief in an afterlife, and so on. A purely relational perspective would also have trouble explaining why exposure to uncanny stimuli—for example, incongruous word pairs like "turn-frog" and "careful-sweater"—seem to cause people to engage in worldview defense by advocating greater punishment for a worldview transgressor (i.e., a prostitute; Randles, Proulx, & Heine, 2011).

By contrast, TMT can handle such findings so long as such epistemically ironic stimuli raise unconscious death concerns (i.e., because they undermine the well-ordered meaning structures that provide a bulwark against death anxiety), which has indeed been documented, albeit in a limited way (Webber, Zhang, Schimel, & Blatter, 2016). In sum, relational perspectives provide plausible alternative explanations for some TMT findings, but not to an extent that would render TMT obsolete.

SELF-FOCUSED PERSPECTIVES

Several theories depict people as fundamentally motivated to protect some core aspects of the psychological self, and these theories are largely compatible with TMT, save for the fact that they do not link psychological self-preservation to physical self-preservation. Among the most prominent, self-affirmation theory (Steele, 1988) posits a motive to maintain self-integrity, a construct similar to global self-esteem. Because self-affirmation theory considers a sense of moral self-worth, living up to societal expectations, and self-efficacy to be among the various supportive elements of self-integrity, the theory dovetails with TMT's conception of self-esteem and worldviews as being structurally and functionally related (e.g., self-esteem comes from living up to worldviews; worldviews serve as a basis for self-esteem). In fact, one of the chief experimental manipulations of self-affirmation is an exercise in which participants write about cherished values, so the theory's concept of self-integrity aligns neatly with TMT's dual-component anxiety-buffer conceptualization. (Self-affirmation theory considers social relationships to be an important part of the self-concept, also fitting nicely within an expanded TMT that includes close relationships as a third anxiety-buffer.) Again, the theories diverge at the point at which TMT identifies death as the

distal threat that gives self-integrity (and its various components) special gravity.

But what if we were to conceptualize mortality as simply a threat to self-integrity? If self-integrity theory is correct, then perhaps one does not need TMT to explain findings that MS increases defense of self-esteem and worldviews; one needs only to entertain the assumption that death threatens a person's continuing efforts to maintain a sense of moral self-worth (among other things).

Indeed, self-affirmation theory, and Tesser's (2000) related perspective on the interchangeability of self-evaluation maintenance mechanisms, can also accommodate the apparent fluidity of self-relevant defenses: the fact that a self-evaluation threat causes spontaneous affirmation of personal values, for example, or the fact that cognitive dissonance induction causes self-esteem defenses (Tesser et al., 2000).

However, as in the sphere of relational theories, TMT proponents would point to data suggesting that self-esteem and value threats increase DTA (Hayes, Schimel, Faucher, & Williams, 2008), which suggests that DTA may be relevant to the defensive process explaining the substitutability of diverse self-esteem defenses. And, as with relational perspectives, a strict self-focused perspective cannot deftly handle some pertinent data, including the disproportionate appeal of worldviews with existentially palliative—but not necessarily self-affirming—content. For example, many devout Christians believe in an afterlife even as their religious worldview also tells them that they are fundamentally flawed "sinners." (If one were predicting the nature of popular worldviews from a self-affirmation perspective, original sin would probably not be at the top of the list.) As with relational perspectives, self-focused perspectives surely have merit in their own right, but seem incapable of matching TMT's explanatory scope.

EPISTEMIC PERSPECTIVES

Epistemic interpretations of TMT's body of research include the MMM, the uncertainty management model (e.g., Van den Bos, 2009) as well, perhaps, as similar approaches such as the McGregor et al.'s (2010; Nash et al., 2011) RAM perspective, which emphasize the experience of uncertainty or anxious arousal following a "discrepancy" (Jonas et al., 2014) as the primary cause of defensive behavior. To some extent, these perspectives have merged into a general integrative framework according to which psychological defensiveness (or "threat-compensation") reflects a common mechanism of palliative response to any episode in which one's goals or expectations are violated (i.e., "disanxiousuncertilibrium"; e.g., Jonas et al., 2014; Proulx, Inzlicht, & Harmon-Jones, 2012; Tritt, Inzlicht, & Harmon-Jones, 2012). Such violations are thought to result in aversive physiological arousal, which in turn prompts people to restore equanimity. They can do

this through direct attention and engagement with the threat, by assimilating it into existing schemata or adjusting schemata to accommodate the new information (i.e., cognitive dissonance reduction). Alternatively, people can seek compensatory palliation through affirming or otherwise maintaining meaning in another domain; for example, by defending salient worldviews or by affirming the self-concept.

The epistemic view is compelling in that it is difficult to find empirical examples where defensiveness is not preceded by some kind of "meaning violation," as defined by the MMM. However, to the extent that epistemic perspectives define meaning violations as the discrepancy between new information and existing mental representations, two potential problems arise. One is that, given that people hold innumerable mental representations—many of which are likely internally inconsistent—it is difficult to predict precisely when a piece of information will be construed as a violation versus a confirmation.

Another problem arises from the notion that the motivational relevance of new information is trivial relative to whether it is perceived as a meaning violation. And yet the recent epistemic perspectives make precisely this claim (e.g., Proulx et al., 2012).

As with relational and self-focused theories, this neutrality regarding worldview (i.e., meaning) content makes epistemic perspectives struggle to account for what is presumably psychologically important content that characterizes most major religions and other ubiquitous worldviews. Moreover, as I have argued elsewhere (Hart, 2014, 2015), despite occasional evidence that people would rather be right than happy (as in self-verification theory; e.g., Swann, Wenzlaff, Krull, & Pelham, 1992), in other cases it seems that people are anything but "anxiously aroused" when their expectations are disconfirmed, as epistemic perspectives predict.

For example, if I expect that a tasty dish of spicy chicken tikka masala will give me heartburn, but in fact it does not, then according to epistemic perspectives, my expectations have been violated and should prompt me to experience aversive arousal and to engage in subsequent defensiveness. Anecdotally, I can report that the empirical evidence on this front does not comport with the epistemic perspectives' prediction!

To take another, less frivolous example, would we expect people with chronically negative expectations about relationships to become anxiously aroused and defensive if suddenly they find things are going their way? Evidence suggests not: for example, people who are insecurely attached (i.e., anxious or avoidant), who by definition harbor negative views of and expectations about their relationships, imagine being loved and supported, they become less defensive, not more (e.g., Saleem et al., 2015).

Epistemic perspectives also predict that having negative expectancies confirmed should *not* elicit anxious arousal and defensiveness. Again, at least in the realm of attachment, this seems not to be true: compared to secure

individuals, insecure individuals are *more* prone to defensiveness in reaction to ostensibly expectation-confirming thoughts of separation, such as a break-up or divorce (e.g., Hart et al., 2005). These findings appear to contradict the notion that defensiveness is solely (or even primarily) a function of expectations instead of, say, desires or hopes.

I do not want to give the impression that the empirical evidence is unequivocal on this topic, but in addition to the empirical evidence, personal experience and common sense do not comport with epistemic perspectives' postulate that meaning violations elicit defensiveness regardless of their implications for other motivational processes. In my view, the preference to have one's expectations—whether positive or negative—confirmed can be a powerful motive, but it exists alongside what may in many cases be a stronger preference to have them disconfirmed. In other words, people have motives and goals that extend well beyond the desire to maintain cognitive consistency; in many cases (including attachment), these motives are specially attuned to ecologically relevant stimuli and seem to operate with minimal concern for whether the stimuli are consistent or inconsistent with expectations. These motives and goals seem, to me, to be at the center of psychological defense. Cognitive consistency is among them, but is not the only one. (For an additional, excellent discussion of these issues, see Routledge, Juhl, & Sullivan, 2009.)

DOMAIN-GENERAL PERSPECTIVES AND THE SECURITY SYSTEM

One way to resolve the problems with epistemic perspectives' implication that epistemic threats (i.e., meaning or expectancy violations) should cause defensiveness regardless of the motivational relevance of the threat is to introduce (or reintroduce) a taxonomy of goals in addition to mere meaning maintenance. Putting goal disruption at the center of the analysis (leaving aside, for now, the content of the goals) has the advantage preserving many valuable insights from existing theories on defensive processes. One example is McGregor et al.'s (2010) RAM perspective, which seems to have begun as an epistemic perspective but has since become more domain-general because it posits that *goal disruptions* are the distal impetus for the anxious uncertainty that triggers (approach-oriented) defensive responses. This is consistent with theories that highlight the sense of personal *control* as a phenomenological state that people are strongly motivated to sustain (Kay, Gaucher, Napier, Callan, & Laurin, 2008; Snyder, 1997).

As I have noted, though, even if a domain-general goal-disruption perspective is appropriately broad relative to the task of accommodating the diverse experimental results generated by TMT and alternative theories, and even if "discrepancy" is a valid description of the neural code or mental

process that mediates defensive behavior, surely there is more than incremental value to theories that provide a taxonomy of motives or goals whose violation is the prime activator of defensiveness. What are the goals that are important to people, and why? Here, TMT and an integrated perspective including attachment theory (Hart et al., 2005; Hart, 2015; Mikulincer et al., 2003) seem to have something to offer, by specifying both the ontogenetically primitive (e.g., attachment) and mature (e.g., existential) concerns that people assiduously tend to in the course of daily life and when prompted with psychology questionnaires.

The security system perspective (Hart et al., 2005) begins with the assumption that attachment is rightfully viewed as a primitive psychological defense system. Even though the attachment system functions to ensure that immature humans are physically protected and cared for, from children's perspective, the primary goal of the attachment system—proximity to a caregiver—is about regulating distress (Bowlby, 1982). Hence, it makes sense that the familiar "turning-to" of a comfort-providing attachment figure in times of distress would serve as the primary template upon which more elaborate defenses are scaffolded. From there, the security system perspective adopts TMT's emphasis on the psychological equation between attachment (being loved and cared for) and self-esteem, as caregivers conditionally (or at least, disproportionately) provide love and support when children are behaving well; naughty behavior ("bad me") is met with a threatening withdrawal of affection. According to TMT, this is how self-esteem assumes its anxiety-reducing properties. Later, cultural value systems (worldviews) provide additional basis for self-esteem, as well as depicting the world in existentially comforting ways (e.g., a place that is orderly, benevolent, meaningful, and enduring). As the anxiety-buffer hypothesis implies, once developed, the resulting interlaced defensive structures form a unitary bulwark against psychological vulnerability. Whenever one component of the overarching system is threatened, the entire system tends to activate to deal with the threat, tempering its effects on psychological security.

This view implies that even if death looms largest as an unavoidable, uncontrollable, permanent, and overarching threat, it is nevertheless plausible that events that undermine relationships, self-esteem, meaning, or other sources of security might cause compensatory defensive responses in a psychologically sensitive animal even if death were not "a thing"—though I would not contest the notion that death contributes to these supportive structures' "specific nature and impetus" (Becker, 1973, p. 11). In other words, the extent of humans' proclivity for defensiveness and certain of its specific qualities (e.g., orientation toward symbolic immortality) are probably best explained by mortality concerns, though defensiveness can otherwise be understood as a general process that confers adaptive benefits by regulating humans' sensitive attunement to threats.

WHERE DO WE GO NOW?

Theoretical alternatives to TMT have generated an important body of evidence and an ongoing series of vigorous and interesting scholarly dialogues. A recent outcome of these developments is the publication of an integrative chapter (Jonas et al., 2014) highlighting core commonalities among TMT and its various alternatives. Among these are (1) an emphasis on either goal conflict or uncertainty as the central theme underlying all threats, (2) a taxonomy of types of defensive responses (e.g., direct and indirect; individual and social), and (3) a sketch of the neurobiological underpinnings of threat and defense. Certainly, this integration owes much to TMT itself, including, for example, the distinction between immediate, threat-focused (i.e., *proximal*) and delayed, indirect/symbolic (i.e., *distal*) defensive modes. I believe the alternative theories deserve to be taken seriously in their own right, even if TMT seems to hold an advantage in the sheer scope of empirical data it can account for.

A definitive resolution will await further evidence and, likely, methodological innovation, because presently, the relevant science is full of discrepancies, inconsistencies, and shortcomings (Hart, 2014). One conundrum concerns the fact that many TMT studies that compare MS to ostensibly parallel alternative (nondeath) threats have found only an effect of MS on relevant outcome measures, whereas many other studies have found that alternative threats have similar or identical effects when compared to MS.

What is the cause of these inconsistencies? One possibility is that researchers have yet to design precise manipulations of psychological threat. Indeed, calibrating the potency of categorically different threats induced in laboratory conditions is one of the major unaddressed challenges in this field. Even if death were not the central threat to psychological equilibrium, it is likely one of the strongest, which makes it difficult to match precisely in experimental comparisons. This could explain some of the empirical inconsistencies.

Another outstanding problem is that of individual differences—TMT and its alternatives are theories about normative psychological processes, but they also bear implications for how people who differ by dint of cultural background, personality, gender, cognitive style, and other variables handle, or should be expected to handle, psychological threats. And yet there, too, the evidence is murky enough that it is premature to draw overarching theoretical conclusions from it. The literature on TMT and alternative theories both include instances of moderated effects where one might expect main effects, and vice versa. To my knowledge, nobody has proposed a satisfactory explanation for this state of affairs. The best one can say is that the field is a work in progress.

The biggest challenge to adjudicating between TMT and the alternative theories is a methodological issue: how to isolate death concerns (or

anything else) as the active ingredient in defensive processes. Because death threatens all things in life, it is impossible to create an experimental comparison condition that makes mortality salient but does not also threaten relationships, self-esteem, meaning, and so on. And because nobody knows enough about the brain to be able to tell precisely what various neural circuits represent, the current approach bearing most promise, perhaps, is the attempt to measure DTA. If a truly reliable, valid, and sensitive DTA measure was devised, then it would not be difficult to assess whether meaning threats and the like induce defensiveness because they increase DTA (but not other negative thoughts). Unfortunately, measures of DTA are not very good, partly because they usually fail to measure the accessibility of other constructs, including, critically, general negativity (Hart, 2014).

It is also possible that as-yet underexplored mechanisms could be at play. One tantalizing candidate may be *psychological pain*. Research over the last decade or so has suggested that parts of the brain's anterior cingulate cortex (ACC) may be involved in the experience of pain in response to social "injury" (e.g., Rotge et al., 2014). The ACC has also been implicated heavily in neuroscience models of psychological threat and defense (e.g., Jonas et al., 2014; Tritt et al., 2012), and some studies have even observed worldview defense responses as a consequence of subliminal exposures to the word "pain" (Holbrook, Sousa, & Hahn-Holbrook, 2011). Perhaps these connections are worth exploring further.

CONCLUSION

> *As in political revolutions, so in paradigm choice—there is no standard higher than the assent of the relevant community... this issue of paradigm choice can never be unequivocally settled by logic and experiment alone.*
>
> Kuhn (1962, p. 93)

Tempting though it may be, causal reductionism is tricky business. Single-factor explanations for complex phenomena often are insufficient. It remains an open question whether the various processes involved in psychological threat and defense (including, but perhaps not limited to, self-preservation, attachment, self-esteem, and worldview-related goals and motives) are organized around a single, identifiable "core"—that is, death or some other concerns. To me, the reciprocal developmental and functional relations among defensive processes suggest that psychological defense is a multifaceted phenomenon consisting of multiple tools and tactics that people acquire throughout the lifespan to cope with a fusillade of diverse threats both large and small—separations, losses, humiliations, uncertainties, and other forms of psychological injury—which may have no true core. It is also possible that different instances of defense reflect different processes.

As of now, plausible alternative theoretical explanations for the results of TMT studies pose a challenge to researchers who wish to test the theory. But they do not, in themselves, indicate that the theory is wrong. The fact that death threatens virtually everything that people care about means that teasing apart the motivational components of "terror management" is daunting business that may well be outside the capacity of experimental social science methodology.

Laboratory studies have established TMT's viability, but it seems fair to say they will not be the final adjudicator; nor is it my purpose here to offer even a provisional determination. Perhaps other modes of inquiry will shed additional light on this fascinating and widely relevant topic; in the meantime, the consensus—or lack thereof—among researchers in this field will hold sway.

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Chapter 4

The Method Behind the Science: A Guide to Conducting Terror Management Theory Research

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Kurt Lewin, the founding father of social psychology, famously surmised, "there is nothing more practical than a good theory" (1952, p. 169). This quote is applicable to terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) as it has initiated over 30 years of empirical research and theory development. Based on the writings of cultural anthropologist Ernest Becker (1973), TMT argues that individuals strive to maintain their beliefs (i.e., cultural worldviews) and pursue self-esteem to reduce the potential for anxiety resulting from the awareness of death. In support, hundreds of studies, conducted in countries around the world, have demonstrated that persons increase their need for self-worth and worldview validation when thoughts of mortality are salient [i.e., the mortality salience (MS) hypothesis]; that enhancing self-esteem and/or activating one's cultural beliefs reduces anxiety following reminders of death (i.e., the anxiety-buffer hypothesis); and how threatening the integrity of either anxiety-buffering defense mechanism heightens the accessibility of death-related thoughts [i.e., the death-thought accessibility (DTA) hypothesis; see Chapter 1, this volume; a graphical depiction of TMT and proposed hypotheses are presented in Fig. 4.1].

Although much can be written about TMT and its hypotheses, the purpose of the current chapter is to discuss methodological considerations when conducting terror management research. Specifically, this chapter provides a resource for social scientists to draw upon when designing and implementing studies on TMT. We begin by providing information (and tabled references) about the manipulations commonly used by terror management researchers to elicit thoughts of death [i.e., mortality salience (MS)], along with a discussion

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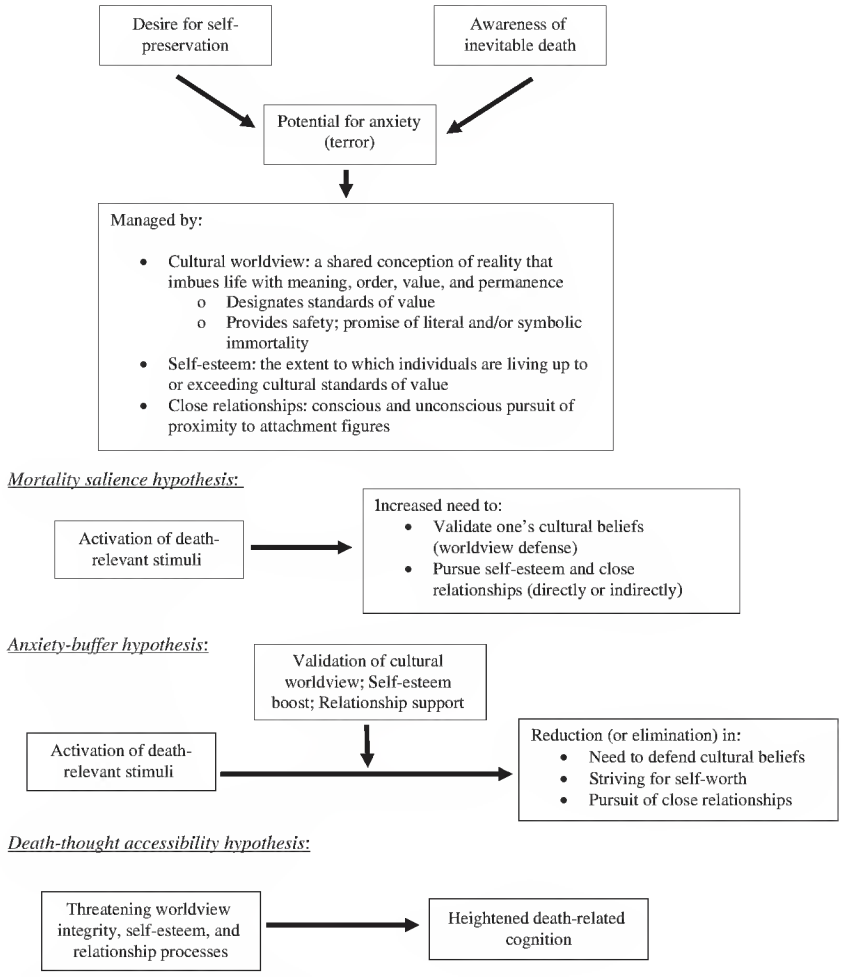


FIGURE. 4.1 A graphical depiction of TMT and its proposed hypotheses.

on the selection of different control conditions. This is followed by a description of the various measures utilized to assess worldview defense (WVD), self-esteem striving, relationship needs, and the accessibility of death-related thoughts. Finally, some of the methodological nuances that are important in successfully eliciting TMT effects are presented (e.g., delay, timing of measures), along with a review of different moderating variables, including individual difference characteristics. In borrowing from social psychologist Greenwald, the hope in the following pages is to demonstrate to researchers, both novice and experienced, that "there is nothing so theoretical as a good method" (2012, p. 99).

MORTALITY SALIENCE MANIPULATIONS

The past 30 years of terror management research has focused on testing several hypotheses derived from the theoretical framework. By far the most oft-tested implication of the theory is that reminders of mortality increase people's need for self-worth, worldview validation, and close relationships (i.e., the MS hypothesis; see Pyszczynski, Solomon, & Greenberg, 2015 for a recent review). MS is thus predicted to lead to more positive reactions to anyone who bolsters these defense mechanisms and more negative responses to anyone who threatens them. The strategy to test this line of reasoning is to ask individuals to think about their own death and to make judgements about others who either violated or upheld important aspects of their cultural worldviews (Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). In a typical TMT experiment, for instance, participants are told that the study is examining the relationship between "personality characteristics and attitudes." After completing a few standard personality questionnaires to maintain the cover story (e.g., need for structure, Neuberg & Newsom, 1993; neuroticism, Eysenck & Eysenck, 1967; self-esteem, Rosenberg, 1965; social desirability, Crowne & Marlowe, 1960), the MS manipulation is introduced (see Fig. 4.2 for a decision tree regarding terror management processes and procedures).

In a metaanalytic review of 277 terror management studies (Burke, Martens, & Faucher, 2010), the most frequently utilized death salience manipulation ($\approx 80\%$ of the reviewed experiments) involves the use of two open-ended questions [sometimes referred to as the Mortality Attitudes Personality Survey (MAPS; Rosenblatt et al., 1989) or the Projective Life Attitudes Assessment (PLAA; Solomon, Greenberg, & Pyszczynski, 1991)]. Individuals primed with mortality awareness are asked to "Briefly describe the emotions that the thought of your own death arouses in you" and to "Jot down, as specifically as you can, what you think will happen to you as you physically die and once you are physically dead." Control participants are asked parallel questions about benign (e.g., watching television: Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992; eating a good meal: Rosenblatt et al.) or aversive topics (e.g., physical pain, public speaking: Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994). Everyone is instructed to answer each question with their first, natural response. One benefit to using a written MS manipulation over another death prime is the ability to analyze responses for mortality-related word counts[1] (e.g., manipulation check, continuous assessment of death awareness), in addition to scoring for different themes (worldview accessibility). Further, this manipulation has been translated into several different languages attesting to the

1. The Linguistic Inquiry and Word Count (LIWC) computer program (Pennebaker, Francis, & Booth, 2001) is useful in analyzing written and verbal languages given the included death dictionary (e.g., dead, coffin, burial).

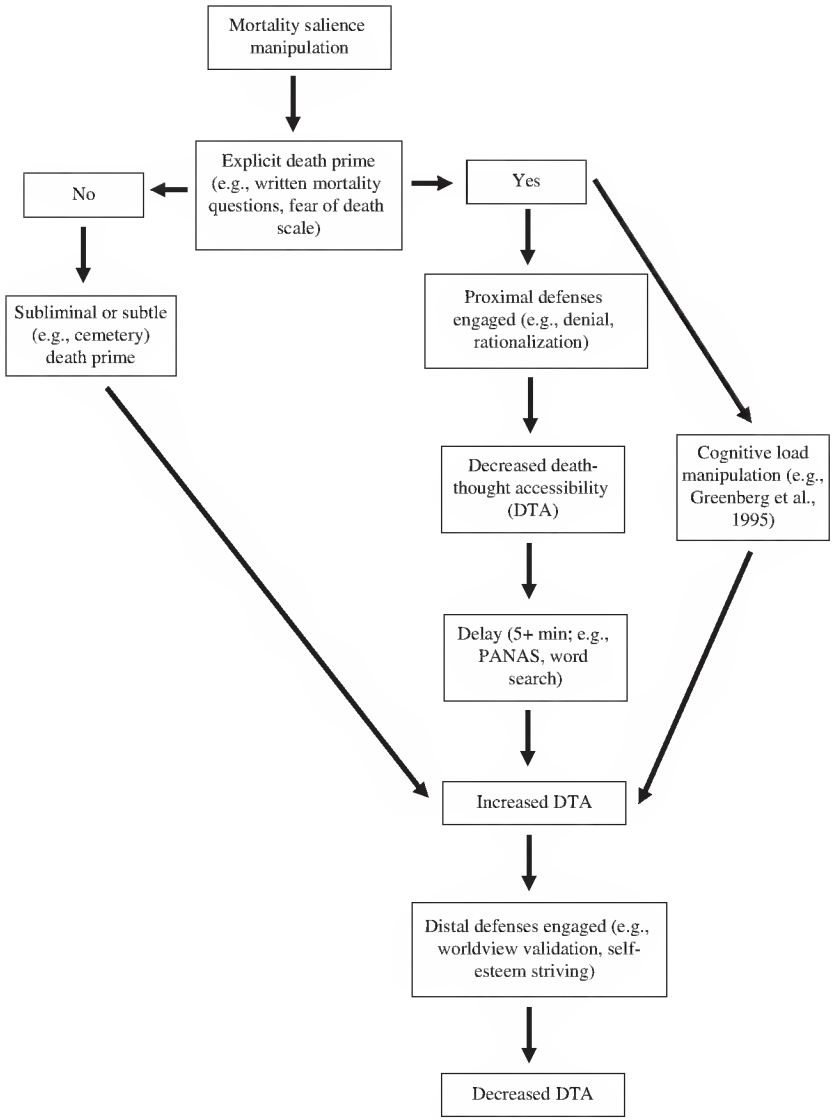


FIG. 4.2 A methodological decision tree of terror management processes and procedures.

construct validity of the prime (e.g., Chinese: Tam, Chiu, & Lau, 2007; Dutch: Deschesne, Janssen, & van Knippenberg, 2000b; Hebrew: Mikulincer & Florian, 2002; German: Jonas & Greenberg, 2004; Japanese: Heine, Harihara, & Niiya, 2002).

Returning to the findings of Burke et al. (2010), the second most frequently utilized explicit death manipulation involves fear of mortality scales

(7% of reviewed experiments). The Death-Anxiety Scale (Templer, 1970), for instance, is a 15-item self-report questionnaire (e.g., "I am very much afraid to die," "The thought of death seldom enters my mind") with responses made in either a true/false or a Likert-type format. Other types of surveys used in TMT research include the Fear of Death Scale (Boyar, 1964), the Revised Collett-Lester Fear of Death and Dying Scale (Lester, 1990), the Multidimensional Fear of Death Scale (Hoelter, 1979), and the Death-Anxiety Questionnaire (Conte, Weiner, & Plutchik, 1982; see Table 4.1; see also Neimeyer, 1994). Similar to written MS manipulations, participants in the control condition are asked parallel questions about a neutral or nondeath-related aversive topic (e.g., "I am very much afraid to speak in front of large groups," "The thought of public speaking seldom enter my mind"). Not only do fear of death scales serve as experimental manipulations, but a summation of items can indicate a continuous measure of death anxiety as both a predictor or as an outcome depending upon the design of the study (e.g., Zaleskiewicz, Gasiorowska, Kesebir, Luszczynska, & Pyszczynski, 2013).

Alternatively, 9% of explicit death salience manipulations summarized by Burke et al. (2010) were categorized as being "other." In some of the initial work conducted on TMT, researchers exposed participants to graphic film footage taken from the *Faces of Death* video series (e.g., an autopsy,

TABLE 4.1 Quick Reference of Some Commonly Used MS Manipulations

Explicit Death	Description	Citation
Open-ended questions (MAPS and PLAA)	Two-opened written questions about death and dying	Rosenblatt et al. (1989, S1); Solomon et al. (1991, S1)
Fear of Death Scale (Boyar, 1964)	26-item Likert-type questionnaire	Rosenblatt et al. (1989, S6)
Fear of Death (Revised Collett-Lester, 1990)	32-item Likert-type questionnaire	Routledge and Juhl (2010)
Death-Anxiety Questionnaire (Conte et al., 1982)	15-item Likert-type questionnaire	Greenberg et al. (1995, S3)
Fear of Personal Death (Florian & Kravetz, 1983)	12-item Likert-type questionnaire	Taubman Ben-Ari et al. (1999, S2)
Multidimensional Fear of Death (Hoelter, 1979)	42-item Likert-type questionnaire	Cicirelli (2002)
Fear of Death (Templer, 1970)	15-item true/false questionnaire	Cox and Kersten (2016, S1)

(*Continued*)

TABLE 4.1 (Continued)

Explicit Death	Description	Citation
Other manipulations:		
Death film footage	e.g., *Faces of Death Vol. (1)*	Greenberg et al. (1992, S1); also see Nelson et al. (1997); Rosenbloom (2003); Tomohiro and Ken-Ichi (2003)
Death images	Exposure to four pictures of death and dying	Baka, Derbis, and Maxfield (2012)
Death passage	Reading an essay about death	Baldwin and Wesley (1996)
Death-related news	Reading or viewing news information about death	Cox and Kersten (2016, S2); Das et al. (2009, S1)
Implicit Death	**Description**	**Citation**
Subliminal death prime	The word "death" versus "field" or "pain" flashed below conscious awareness	Arndt et al. (1997, S1)
Death word search puzzle	Word search with death words embedded	Maxfield et al. (2007, S2)
Advertising flyer	A flyer for an institute that studies death	Hirschberger et al. (2008, S2)
Other manipulations:		
Death word lexical decision task	6 out of 42 words are death-related	Fritsche et al. (2010, S1)
Death sentence scramble	7 out of 28 sentences are death-related	Hirschberger (2006, S2)
Death world completion	10 out of 30 words are death-related	Zhou et al. (2008, S1)
Naturally Occurring	**Description**	**Citation**
Cemetery	Participants completed surveys by a cemetery	Gailliot et al. (2008, S3)
Funeral home	Participants completed surveys by a funeral home	Pyszczynski et al. (1996, S1–S2)
Natural disaster	Participants completed surveys after a flood	Mann and Wolf (2016)
Terrorist attack	Participants completed surveys following a terrorist attack	Fischer, Greitemeyer, Kastenmüller, Frey, and Oßwald (2007, S1)

death row execution: Greenberg, Solomon et al., 1992; also see Nelson, Moore, Olivetti, & Scott, 1997; Rosenbloom, 2003; Tomohiro, & Ken-Ichi, 2003 for other film manipulations). Neutral film participants watched clips from the same video that did not portray graphic depictions of death. In conducting literature searches in preparation of this chapter, we counted 19 other different ways in which thoughts of death have been explicitly primed beyond what has already been discussed. Given space limitations, some of these methods include being interviewed in front of a cemetery or funeral home (Gailliot, Stillman, Schmeichel, Maner, & Plant, 2008; Pyszczynski et al., 1996), viewing a mortality-related flier (Hirschberger, Ein-Dor, & Almakias, 2008), reading a news article (Cox & Kersten, 2016; Pyszczynski & Kesebir, 2011), watching a slideshow (Hong, Wong, & Liu, 2001), and seeing images of death on a cigarette package (Hansen, Winzeler, & Topolinski, 2010). Although explicit MS manipulations account for a bulk of the research conducted on TMT, their use has the potential to impact the administration and timing of dependent variables (i.e., the distinction between proximal vs distal defenses), as well as heightening blatant mortality awareness (see Chapter 2, this volume).

To curb this problem, TMT researchers have also utilized implicit (or subtle) manipulations to activate thoughts of mortality. Arndt, Greenberg, Pyszczynski, and Solomon (1997), for example, subliminally primed MS by having individuals complete a categorization task where two words were shown at 428 ms each while participants indicated whether the words were related or not (e.g., "fajita" and "sneaker" vs "flower" and "rose"). For 43 ms between each word pair (10 trials total), individuals were presented with either the word *death* or the word *field*. The results revealed that the subliminal presentation of the word *death* led to significantly higher levels of DTA in comparison to the control condition. Further, the MS prime resulted in a greater preference for a pro-American author in comparison to an anti-American author, indicating heightened WVD. A similar pattern of results emerged in subsequent studies when the death salience prime was compared to a negative word (*pain*). Returning to the metaanalytic results of Burke et al. (2010), 4% of the reviewed studies had utilized a subliminal prime to activate mortality awareness.

Subtle MS manipulations function similarly to subliminal primes to activate existential concerns. For instance, Maxfield et al. (2007) gave participants a word search in which several death-related words were embedded. Participants' exposure to the mortality words, while not being the direct target of their search, successfully manipulated death awareness and led to immediate effects on defensiveness. Further, Fritsche, Jonas, Niesta Kayser, and Koranyi (2010) manipulated MS by having the poem *A Funeral Fantasy* by Friedrich Schiller written on a board in front of the room. The poem included several death words (e.g., died, corpses) that were circled in red. Individuals were told to ignore the previous class notes (i.e., the poem) but

to pay attention to a numeric code written on the board to advance the study. Other types of subtle manipulations include sentence scramble tasks (Hirschberger, 2006), a lexical decision task with death-related words (Fritsche, Jonas, & Fankhänel, 2008), the subliminal presentation of skull images (Holbrook, Sousa, & Hahn-Holbrook, 2011), and the use of a word-fragment completion task (Hayes & Schimel, 2018; Zhou, Liu, Chen, & Yu, 2008). Interestingly, given the various ways in which reminders of death can be manipulated (implicit vs explicit), researchers have found no statistical difference in effect size estimates between the different types of MS primes being used (Burke et al., 2010).

Before ending the discussion on the different death manipulations, it is important to spend some time on the selection of control conditions. In many of the initial TMT experiments, researchers compared the effects of participants exposed to thoughts of mortality to those who were presented with a benign topic—for instance, eating a good meal or watching television (Greenberg, Simon et al., 1992; Rosenblatt et al., 1989). To demonstrate that increases in cultural WVD and self-esteem striving were specific to death awareness and not negative thoughts in general, subsequent studies exposed individuals to aversive events, including public speaking (Greenberg et al., 1994), being socially excluded (Landau, Greenberg, Solomon, Pyszczynski, & Martens, 2006), general anxieties (Arndt, Greenberg, Simon, Pyszczynski, & Solomon, 1998), meaninglessness (Baldwin & Wesley, 1996), uncertainty (Landau et al., 2004), failure (Greenberg, Simon, Pyszczynski, & Solomon, 1996), an important exam (Greenberg, Porteus, Simon, Pyszczynski, & Solomon, 1995), being paralyzed (Arndt, Greenberg, Solomon, Pyszczynski, & Schimel, 1999), dental or physical pain (Arndt & Greenberg, 1999; Greenberg et al., 1994), or the death of loved one (Greenberg et al., 1994). With respect to the metaanalytic results of Burke et al. (2010), a majority of the summarized research used a negative or threatening control topic ($\approx 62\%$), while approximately 34% of the studies used a positive (e.g., eating food: Greenberg et al., 1990) or neutral control condition. Four percent of studies had no comparison group at all. Adding to this, Burke et al. found that there was no significant difference between effect sizes for studies using either threatening or nonthreating control conditions.

The inclusion of the different control conditions has also been utilized to rule out alternative explanations to TMT (see Chapter 3, this volume). Several theories have argued that experiencing self-related threats other than death have the potential to produce effects similar to traditional MS manipulations. For instance, according to the meaning maintenance model (Heine, Proulx, & Vohs, 2006), because humans are meaning-making animals, challenges to meaning should lead to attempts to restore it. Researchers thus argue that MS is no different from other attacks to meaning (e.g., meaninglessness, alienation/rejection, uncertainty) in people's attempt to construct and/or affirm a sense of value. Further, van den Bos and Miedema (2000),

van den Bos, Poortvliet, Maas, Miedema, and van den Ham (2005), and McGregor, Zanna, Holmes, and Spencer (2001) have suggested that thoughts of personal uncertainty have the potential to produce defensive responses similar to that observed in TMT studies. Uncertainty, or lack of control, is also a characteristic in Martin's (1999) I-D compensation theory as an alternative explanation for MS effects. Based on these different theoretical perspectives, several terror management researchers have demonstrated that participants express greater defensiveness following reminders of death but not in response meaninglessness or uncertainty primes (Baldwin & Wesley, 1996; Greenberg & Arndt, 2012; Landau et al., 2004). To examine this further, Burke et al. (2010) found that the effect size estimates for studies comparing MS to future worry, uncertainty, and social isolation were no different than terror management experiments exploring the difference between reminders of death and neutral control conditions (e.g., watching TV). Further, in a separate metaanalysis, Martens, Burke, Schimel, and Faucher (2011) demonstrated that although there was no difference between MS and meaning/certainty threats on WVD following a short delay, a longer delay resulted in greater belief validation for participants primed with thoughts of death but not threats to meaning/uncertainty. These findings thus suggest that the relationship between thoughts of mortality and belief validation can be distinguished from other threatening cognitions and experiences.

Having reviewed the various ways in which MS has been manipulated, and providing a discussion of different control conditions, the next section focuses on the need for a delay to elicit distal (see Chapter 2, this volume) TMT effects. Because MS effects are strongest when the awareness of death is just outside of conscious awareness (Pyszczynski, Greenberg, & Solomon, 1999; see Chapter 2, this volume), different manipulations are better suited to precede different delay lengths. Therefore, choosing the appropriate delay between the administration of the manipulation and the assessment of the dependent variable will lead to the greatest MS effects.

WHEN DO MS EFFECTS OCCUR? THE ROLE OF A DELAY

Much of the early work on TMT demonstrated that individuals were more likely to defend their cultural beliefs when explicit thoughts of mortality were salient (Greenberg et al., 1990; Rosenblatt et al., 1989). Interestingly, however, several studies revealed conflicting results in that some individuals were less willing to defend their cultural worldviews following explicit MS primes (Greenberg et al., 1994). This led researchers to develop a duel cognitive model of TMT whereby distinctions were made between *proximal* and *distal* defense processes. Pyszczynski et al. (1999) reasoned that if thoughts of death were really disturbing, people should engage in efforts to suppress MS through distraction or by minimizing the issue from consciousness altogether (e.g., underestimating their risk of mortality). Proximal defenses are

thus rational or pseudorational, threat-focused, and are primarily activated when mortality concerns are in conscious awareness. Distal defenses, in turn, are associated with maintaining self-esteem and faith in one's cultural beliefs to control the potential for anxiety resulting from the awareness of death. These processes are not related to death in any rational or semantic way, and emerge when mortality concerns are outside of focal attention, or on the fringes of consciousness (see Fig. 4.3 for a graphical depiction of TMT proximal and distal defenses).

In support of the duel process model, Greenberg et al. (1994) demonstrated that WVD was more likely to occur following a brief MS manipulation. When death concerns were made blatant by having participants complete a second mortality reflection task, individuals were less likely to defend their cultural beliefs presumably due to the suppression of death-related thoughts. Thus, if thoughts of mortality increase WVD when such cognitions are unconscious but highly accessible, then having participants continually think about death following an MS manipulation should lead to less defense of one's cultural beliefs relative to a condition where thoughts

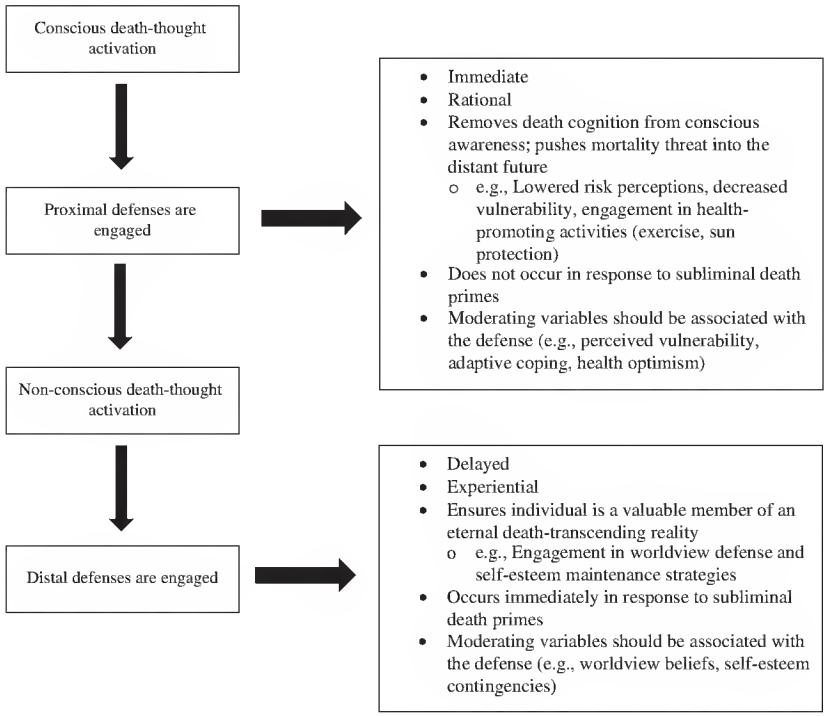


FIGURE. 4.3 Proximal and distal TMT defenses.

of death can recede from focal awareness. This was supported in two additional experiments conducted by Greenberg and colleagues. Specifically, in comparison to individuals who were distracted following a death salience prime, persons who were required to keep thoughts of mortality in conscious awareness were less likely to endorse a pro-American author. These findings thus suggest that individuals are effectively able to suppress mortality-related concerns following a death manipulation. However, when such thoughts become highly accessible following a delay, this leads to greater WVD and self-esteem maintenance.

Since this early work, it has become standard practice to include a delay following an explicit MS manipulation to elicit distal terror management effects. Based on the metaanalytic findings of Burke et al. (2010), researchers found that many of the experiments (≈93%) utilized a distraction between the MS manipulation and the administration of the dependent variable(s), with approximately 68% of experiments using one task, 22% having two tasks, and 3% of the studies using three tasks (≈7% of experiments had no delay). The most common delay (≈48%) utilized by researchers is the 20-item Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988), or the 60-item expanded version of the measure (PANAS-X; Watson & Clark, 1992). These questionnaires ask participants to rate their current mood on a five-point scale (1 = *not at all*; 5 = *extremely*) with 10 (or 30) of the items being focused on positive affect (e.g., excited, inspired) and 10 (or 30) of the items being focused on negative affect (e.g., afraid, nervous). Other commonly used delay tasks include filler personality questionnaires (18%; e.g., Schmeichel et al., 2009), word search puzzles (≈ 9%; e.g., Greenberg et al., 1994), and other mood scales [≈ 5%; Brief Mood Introspection Scale: Mayer & Gaschke, 1988 (e.g., Schmeichel et al., 2009); Multiple Affect Adjective Checklist: Zuckerman & Lubin, 1965 (e.g., Rosenblatt et al., 1989)].

The aforementioned measures are not the only delay tasks utilized in TMT studies. For instance, researchers have distracted participants following a death salience manipulation by having individuals read a one-page story excerpt (Camus, 1958: *The Growing Stone*; Harmon-Jones et al., 1997), write for a period of time (Arndt et al., 1999), answer questions about different leisure activities (Florian, Mikulincer, & Hirschberger, 2002), work on different logic and verbal fluency problems (Echebarria-Echabe, 2013), complete a word-stem completion task (Edmondson et al., 2011), read a news article (Arndt et al., 1999; Trafimow & Hughes, 2012), or evaluate different keyboard symbols ("%" and "@"; Deschesne et al., 2003). Of the studies that have included two distraction tasks as a delay, these experiments typically have the PANAS followed by a word search puzzle (Greenberg et al., 1994) or two puzzle tasks presented together (Arndt, Cook, Goldenberg, & Cox, 2007; Edmondson et al., 2011). Importantly, returning to the metaanalysis results of Burke et al. (2010), researchers found that studies that employed

three distraction tasks (e.g., mood scale, puzzle task, and filler questionnaire; Friedman & Rholes, 2008) or two delay tasks yielded significantly higher effect sizes when compared to single or no-delay experiments. Further, although it is common practice to include a 3–5 min delay between the administration of an explicit death prime and distal defenses (Pyszczynski et al., 1999), Burke et al. revealed that studies with longer delays (7–20 min; e.g., Echebarria-Echabe, 2013; Friedman & Rholes) produced significantly larger effects than those with shorter delays (2–6 min). This has also been found with respect to DTA (Steinman & Updegraff, 2015).

The discussion thus far has focused on the role of a delay in assessing distal defenses following an explicit death salience prime. One question, however, is whether a distraction is necessary in response to an implicit MS manipulation (e.g., the subliminal presentation of mortality-related words). According to the duel process model of TMT (Pyszczynski et al., 1999), a delay is not needed in such instances because DTA is heightened with no reason to engage in suppression/distraction. In other words, proximal efforts are essentially "skipped" as participants immediately engage in distal defenses, such as self-esteem maintenance and worldview validation. In support, Arndt et al. (1997) demonstrated that individuals experienced a greater accessibility of death-related thoughts and higher defense of their cultural beliefs in response to the subliminal presentation of the word *death* in comparison to the word *field* (Study 1) or the word *pain* (Study 2). A similar pattern of results emerged after an explicit MS prime. Whereas the written death manipulation was followed by a delay prior to the assessment of the dependent variables, individuals in the subliminal MS condition completed the DTA and WVD measures immediately after the presentation of the independent variable (Arndt et al.). Further, in cases where death cognition is not activated directly (e.g., priming self-esteem or worldview threats), an increase in mortality awareness may decline in response to a delay (Schimel, Hayes, Williams, & Jahrig, 2007; Martens et al., 2011). In these instances, similar to implicit MS inductions, attitude and behavioral assessments should be made immediately after the worldview threat manipulation has been introduced.

OUTCOMES VARIABLES: WORLDVIEW DEFENSE, SELF-ESTEEM, AND CLOSE RELATIONSHIP STRIVING

Although TMT was originally developed to explore the sources and need for self-esteem based on worldview beliefs, research has demonstrated that self-worth may be derived from many different domains and that culture may be defended in various ways. Most TMT measures fall into several broad categories including WVD, self-esteem striving, need for close relationships (NCR), and DTA (see Tables 4.2 and 4.3). While these will be further discussed, researchers should look to other chapters within this handbook for more detailed accounts of how certain responses to death have been measured.

TABLE 4.2 Quick Reference of Some Commonly Used TMT Measures

Worldview Defense	Description	Citation
Accessibility of nationalistic constructs	7-word stem fragments to access nationalistic thoughts	Arndt, Greenberg, Schimel, Pyszczynski, and Solomon (2002; S1)
Aggression	Hot sauce allocation to a worldview threatening other	McGregor et al. (1998, S1)
Attitudes toward immigrants	Evaluation of culturally similar or dissimilar immigrants	Bassett and Connelly (2011); Weise, Arciszewski, Verlhiac, Pyszczynski, and Greenberg (2012)
Conformity	Degree in which participants conformed with others	Renkema, Stapel, Maringer, and van Yperen (2008)
In-group/out-group evaluations	Assessment of those with similar/dissimilar backgrounds	Greenberg et al. (1990, S1); Greenberg et al. (1992, S1)
Moral transgressions	Scenarios rated on degree of transgression and severity of punishment	Florian and Mikulincer (1997); Cox et al. (2007, S1)
Political attitudes	Support for presidential candidates	Cohen, Solomon, Maxfield, Pyszczynski, and Greenberg (2004); Landau et al. (2004, S1, S3, and S4); Weise et al. (2008, S1)
Prejudice	Attitudes toward different races and racists	Bradley, Kennison, Burke, and Chaney (2012); Greenberg, Schimel, Martens, Solomon, and Pyszczynski (2001; S3)
Pro- and anti-American essays	Essays and evaluations of pro- and anti-American authors	Greenberg et al. (1990; S3)
Stereotyping	Support for stereotypical attitudes	Renkema et al. (2008); Schimel et al. (1999, S1–S5)
Support for violence	Support for violence against others; self-sacrifice	Hirschberger et al. (2016, S1 and S3); Jonas et al. (2008, S2); Pyszczynski et al. (2006, S1–S2); Routledge and Arndt (2008); Weise et al. (2008, S2)
Self-Esteem	**Description**	**Citation**
Body identification	Greater body identification when associated with self-esteem	Goldenberg et al. (2000, S1–S3)

(*Continued*)

TABLE 4.2 (Continued)

Self-Esteem	Description	Citation
Exercise	Exercise intentions when associated with attractiveness	Arndt et al. (2003, S2; 2009, S4)
Financial success	Expected financial success 15 years in future	Kasser and Sheldon (2000, S1)
Grip strength	Greater strength when associated with self-esteem	Peters, Greenberg, Williams, and Schneider (2005)
Implicit self-esteem evaluation	Attitudes toward self-based on implicit association test	Cox et al. (2008, S3)
Risk-taking	Appearance concerns associated with driving, general activities, and scuba diving	Taubman Ben-Ari et al. (1999, S1–S4); Hirschberger et al. (2002); Miller and Taubman Ben-Ari (2004; S1–S2)
Self-perception biases	Biases in the interpretation of self-relevant information	Deschesne et al. (2003, S1–S2); Mikulincer and Florian (2002, S1–S2)
Self-other similarities	Perceptions of similarity to others	Arndt et al. (2002, S1); Simon, Greenberg, Arndt et al. (1997); Simon, Greenberg, Harmon-Jones et al. (1997a,b)
Smoking	Smoking intentions when associated with attractiveness	Arndt et al. (2009, S2); Martin, Kamins (2010)
Tanning	Tanning intentions when associated with attractiveness	Arndt et al. (2009, S1 and S3); Cox et al. (2009, S1–S2); Routledge et al. (2004; S1–S2)
Close Relationship	**Description**	**Citation**
***Relationship desire*:**		
Relationship initiation	Willingness to initiate social interaction	Taubman Ben-Ari et al. (2002, S1)
Commitment	Commitment to one's romantic partner	Cox and Arndt (2012; S3 and S6); Florian et al. (2002, S1)

(*Continued*)

TABLE 4.2 (Continued)

Close Relationship	Description	Citation
Mate attractiveness	Ratings of attractiveness in a potential dating partner	Kosloff et al. (2010, S1–S2); Landau et al. (2006, S1–S4); Silveira et al. (2014); Śmieja et al. (2006)
Romantic beliefs	Endorsement of "love at first sight" ideology	Smith and Massey (2012, S1–S2)
Sexual desire	Desire to have sex	Birnbaum et al. (2011, S1–S4); Goldenberg et al. (2000, S2; 2002, S2)
Relationship maintenance:		
Intimacy	Desire for intimacy	Hirschberger et al. (2003); Mikulincer and Florian (2000; S5); Yaakobi, Mikulincer, and Shaver (2014, S4)
Forgiveness	Forgiveness toward a romantic partner	Van Tongeren et al. (2013, S1–S2)
Perceived regard	Perceived regard from a romantic partner	Cox and Arndt (2012, S1, S2, and S5)
Memory bias for positive others	Recall a positive memory of a parent or close friend	Cox et al. (2008, S1); Wakimoto (2011)
Relationship satisfaction	Romantic partner satisfaction and closeness	Anglin (2014); Miller (2003, S1)
Relationship concerns:		
Jealousy	Sexual and emotional jealousy of a romantic partner	Goldenberg et al. (2003, S2–S3)
Fear of intimacy	Activated thoughts of fear of intimacy	Taubman Ben-Ari (2004; S1 and S3)
Relationship conflict	Imagined relationship problems	Florian et al. (2002, S3)
Risk-taking	Sexual risk-taking	Lam et al. (2009, S1–S3); Taubman Ben-Ari et al. (1999, S1)
Separation	Imagined separation from a romantic partner	Mikulincer et al. (2002, S1–S3)

TABLE 4.3 Quick Reference of Some DTA Assessments

DTA Measure	Description	Citation
Word-stem tasks:		
Two word-stem completion task	Two words out of five total words	Dunkel (2009, S3)
Four word-stem completion task	Four words out of 20 total words; DTA assessed twice	Arndt et al. (1997a, S1)
Five word-stem completion task	Five words out of 35 total words	Cox et al. (2008, S1)
Six word-stem completion task[a]	Six words out of 20 total words	Greenberg et al. (1994, S4)
Seven word-stem completion task	Seven words out of 26 total words	Arndt et al. (1997b, S1 and S3)
Eight word-stem completion task	Eight words out of 18 total words	Florian, Mikulincer, and Hirschberger (2001, S2)
10 word-stem completion task	10 words out of 30 total words	Zhou et al. (2008)
11 word-stem completion task	11 words out of 16 total words	Rutjens et al. (2009, S1)
13 word-stem completion task	13 words out of 39 total words	Burris and Rempel (2004, S6)
17 word-stem completion task	17 words out of an unknown number of words	Das et al. (2009, S1)
Lexical decision tasks:		
Lexical decision task	Seven death-related words presented	Koole and Van den Berg (2005, S4)
Lexical decision task	10 death-related words presented	Arndt et al. (2007, S3)
Other measures:		
Conversation analysis	Number of death-related words used in a conversation	Cox and Kersten (2016)
Implicit association test	Associating death-related words with "self" versus "other"	Bassett (2005, S1)
Picture task	Picture can be interpreted as a skull or two men	Gailliot, Schmeichel, and Baumeister (2006, S1B)
Writing task	Number of death-related words used in a story	Gailliot et al. (2007, S1)

[a]*Indicates the most frequently used word-fragment completion measure.*

Worldview Defense

A majority of the work conducted from a TMT perspective has examined individuals' defense of their cultural beliefs (Burke et al., 2010). Originally, WVD was measured by recommendations for bail amounts set by municipal court judges for a morally corrupt individual (i.e., a prostitute; Rosenblatt et al., 1989). Judges reminded of their mortality set significantly higher bonds than those in the control condition ($455 vs $50, respectively). These results were expected given that a morally corrupt person should be particularly threatening to judges who are supposed to uphold the laws and virtues of society. Additional research has helped to clarify this response by finding that worldview violating others (i.e., prostitutes) are punished more harshly by those who view prostitution as being wrong (Study 2). According to TMT, WVD can also be positive in that persons who uphold cultural values (e.g., stopping a criminal) are given a significantly higher reward following an MS manipulation than a control ($3476 vs $1112, respectively; Study 3).

The above research, considered a "general attitude" toward others, accounted for roughly 47% of the experiments summarized by Burke et al. (2010). Additional studies, which have assessed indirect evaluations after MS, include whether individuals express a greater desire for children (Wisman & Goldenberg, 2005), their belief in a supernatural agent (Norenzayan & Hansen, 2006), and their general attitude toward different sports teams (Deschesne, Greenberg, Arndt, & Schimel, 2000a) or their country of origin (Jonas, Fritsche, & Greenberg, 2005). Another commonly utilized measure of general attitudes involves the Multidimensional Social Transgression Scale (MSTS; Florian & Mikulincer, 1997). The MSTS contains 20 vignettes of an intrapersonal (e.g., body mutilation; serious damage to life) or interpersonal nature (e.g., threats to family members/friends; a loss of social identity). Each "newspaper article" scenario is specific in terms of what is being transgressed (e.g., a doctor mixing up patient records) and the consequences of what transpired (e.g., a mistaken leg amputation). Participants are asked about the degree of the transgression severity and the strictness of the punishment. Studies utilizing the MSTS have found that the scale serves as a measure of WVD in that persons express harsher judgments following thoughts of mortality versus a control (Florian & Mikulincer). Shorter versions of the questionnaire have also been utilized to assess WVD (Cox, Goldenberg, Arndt, & Pyszczynski, 2007).

Many of the WVD measures used in TMT research comprise of the evaluation of a target person ($\approx$ 25% of experiments; Burke et al., 2010). The most common dependent variable, found in approximately 9% of Burke et al.'s reviewed studies, involves the evaluation of an essay author who either agrees or disagrees with the participant's worldview (Greenberg et al., 1990; Greenberg Simon et al., 1992). Findings generally indicate that,

following MS, responses to a pro-American essayist (e.g., "America truly is a great nation and I do not regret my decision to come here at all") become more favorable while responses to the anti-American essayist (e.g., "America is a cold country that is unsensitive to needs and problems of foreigners") become more negative. Derogation occurs as lower ratings to the antiessayist indicates the target as being less intelligent and likable. Variations of these pro- and antiessays have been utilized cross-culturally and with different themes to produce similar results (e.g., Deschesne et al., 2000b; Navarrette, 2005; Tam et al., 2007). Further support for increased WVD with respect to person evaluations has been demonstrated by Greenberg and his colleagues (1990; Study 1). In this research, experimenters had Christian participants evaluate religious others who either supported (i.e., fellow Christians) or challenged their cultural beliefs (i.e., Jews) following reminders of death. The results revealed that in comparison to control conditions, the MS manipulation led Christians to provide higher interpersonal judgements of fellow Christians and more negative evaluations of Jewish persons. Similar results have also been obtained for liberals and conservatives (Greenberg, Simon et al., 1992). Importantly, the selection of different WVD measures should be based on the researchers' target population of interest [e.g., a conservative political type should respond more harshly to an essay criticizing one's culture or government; a religious fundamentalist should be more critical of someone or something (e.g., news article) that attacks his/her faith]. It is thus important to pretest different values and beliefs prior to the introduction of an MS manipulation in one's research.

Based on the metaanalytic findings of Burke et al. (2010), more than 10% of TMT experiments utilized a behavioral assessment of WVD. In some of the first studies, conducted by McGregor et al. (1998), researchers demonstrated that MS increases aggression toward a worldview threatening other. Specifically, participants in this work were randomly assigned to an MS manipulation followed by an essay that either attacked or bolstered their political viewpoint. In a "second study" described as an experiment on "personality and taste preferences," individuals could allocate an amount of painfully hot, hot sauce for the supposed essay author to ingest. The results revealed that, in comparison to the control conditions, participants dispensed significantly more grams of hot sauce to someone who challenged their political views following reminders of death. This is considered an aggressive response because the supposed author of the essay stressed his dislike of spicy foods. Other studies have demonstrated that individuals are more likely to engage in risky driving in a video simulator (Taubman Ben-Ari, Florian, & Mikulincer, 1999), donate money to charity (Jonas, Schimel, Greenberg, & Pyszczynski, 2002), spend more time washing their hands (Strachan et al., 2007), display stronger grip strength (Peters, Greenberg, Williams, & Schneider, 2005), use a foot massager (Goldenberg et al., 2006), submerge one's hand in cold water (Goldenberg et al., 2006), and sit closer and

socialize with other individuals following reminders of death (Smith & Kasser, 2014; Taubman Ben-Ari, Findler, & Mikulincer, 2002).

A final category of WVD includes the use of cognitive heuristics and emotions when mortality concerns are salient (≈ 18% of studies; Burke et al., 2010). For instance, in a series of experiments conducted by DeWall and Baumeister (2007), researchers were interested in whether participants experienced more positive emotions in response to an MS manipulation. In this work, it was hypothesized that the threat of mortality would increase the search for positive, emotionally pleasant information to offset the potential for anxiety resulting from the awareness of death. The results of three experiments showed that participants were more likely to express a greater accessibility of positive-related thoughts, as assessed by a word-stem completion measure or a lexical decision task, in response to reminders of mortality. Similar MS effects have been observed on fear (Lambert et al., 2014) and anger emotions (e.g., Burke et al., 2010). With respect to cognition, individuals have been shown to rely on heuristics, or mental short-cuts, when death concerns are salient. These include a tendency to engage in a confirmation bias (Jonas, Greenberg, & Frey, 2003), employing self-serving attributions (Deschesne et al., 2003; Mikulincer & Florian, 2002), and adopting representativeness heuristics (e.g., stereotyping; Schimel et al., 1999).

Self-Esteem Striving

While WVD is the most widely studied topic under TMT, the theory was initially put forth to explain the maintenance, source, and need for self-esteem (see Chapter 7, this volume). Self-esteem refers to an individual's evaluation of the self, with most persons maintaining high levels of self-esteem by defending themselves when their self-worth is under threat (Solomon et al., 1991). From the perspective of TMT, self-esteem is a culturally based construction of reality that consists of viewing oneself as living up to or exceeding the standards of value put forth by one's culture (see Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). This suggests that individuals should strive to defend, or enhance, significant sources of self-worth following reminders of death. Several early studies investigating the effects of MS on self-esteem striving [e.g., Rosenberg's (1965) self-esteem scale] produced mixed or nonsignificant findings (Koole, Deschesne, & van Knippenberg, 2001; Sowards, Moniz, & Harris, 1991). One problem was that these experiments were conducted without a delay/distraction included. Further, according to Pyszczynski and Greenberg (1987), there are many sources of self-esteem for people to rely upon, along with a global sense of self-esteem, which can be exaggerated for self-serving reasons. This is why self-esteem striving after MS is typically examined indirectly—for instance, through people's efforts to live up to cultural standards (Kashima, Halloran, Yuki, & Kashima, 2004); by experiencing heightened distress when violating

their beliefs (Greenberg et al., 1995); and/or through greater biases in the interpretation of self-relevant information (Deschesne et al., 2003; Mikulincer & Florian, 2002).

In support of this reasoning, Greenberg, Simon et al. (1992) found that reminders of death increased tolerance for a worldview threatening other among persons who were more liberal in their political orientation. Similar effects emerged among participants who were primed with the value of tolerance. Although self-esteem was not examined directly, these results suggest that mortality concerns lead to increased efforts to live up to the value of tolerance for those who dispositionally value the trait, as well as persons who are situationally primed with the characteristic. Conceptually similar results have been found in cross-cultural samples. For example, Kashima et al. (2004) showed that Japanese participants with low self-esteem responded to MS by becoming less individualistic in their attitude orientation while low self-worth Australians became more individualistic. These results reflect the prescribed values placed on collectivistic (i.e., an emphasis on group membership) and individualistic cultures (i.e., an emphasis on autonomy and personal goals), respectively. Finally, as evidence of self-esteem striving based on cultural standards of value, other studies have demonstrated that reminders of death increase Americans' desire for high status items (e.g., a Lexus vs a Geo-Metro automobile; Mandel & Heine, 1999), greed, and monetary success (Kasser & Sheldon, 2000) given that materialism and financial well-being are highly valued within the United States.

To provide more direct evidence for the need for self-worth when thoughts of death are salient, Taubman Ben-Ari et al. (1999) found that participants who derived self-esteem from their driving abilities engaged in more risky driving behavior in a game simulator following MS. This effect was eliminated when participants were given positive feedback about their driving behavior prior to being placed in the simulator (also see Hirschberger, Florian, Mikulincer, Goldenberg, & Pyszczynski, 2002; Miller & Taubman Ben-Ari, 2004). Self-esteem striving following MS has also been shown to increase grip strength among those who value physical strength as a source of self-esteem (Peters et al., 2005); heightened body identification among those who value physical appearance (Goldenberg, McCoy, Pyszczynski, Greenberg, & Solomon, 2000); greater exercise and tanning intentions if such activities are an important contingency of self-worth (Arndt et al., 2009; Arndt, Schimel, & Goldenberg, 2003; Cox et al., 2009; Routledge, Arndt, & Goldenberg, 2004); higher helping and donation intentions to the extent that one's self-esteem is based on such behavior (Jonas et al., 2002; Schimel, Wohl, & Williams, 2006); and greater willingness to binge drink (Jessop & Wade, 2008) and smoke (Arndt et al., 2009; Martin & Kamins, 2010) when these are relevant to one's sense of self. Self-esteem striving has also been assessed indirectly through people's relationships with close others (e.g., implicit association test; Cox et al., 2008; perceived regard, Cox & Arndt, 2012).

The pursuit of self-worth can also be a compensatory response to reminders of mortality. This has been demonstrated with experimental manipulations or among persons with dispositional high self-esteem (Greenberg, Solomon et al., 1992; Harmon-Jones et al., 1997). Given space limitations, a discussion of this work is provided below under the "Variables Found to Moderate MS Effects" section.

Need for Close Relationships

Before ending this section, we would like to make mention of research examining the importance of close relationships in response to existential anxieties. Although TMT was originally proposed to explore the need and maintenance of self-esteem as derived from worldview validation in response to thoughts of death, Mikulincer, Florian, and Hirschberger (2003) argued that close relationships serve as a separate form of defense against the awareness of mortality. Based on Bowlby's (1969) attachment theory, and consistent with other perspectives suggesting a fundamental need for close others (e.g., Baumeister and Leary, 2000; Deci & Ryan, 2000; Maslow, 1968), Mikulincer et al. made the case that close relationships serve many different terror management processes—for example, as a source of symbolic immortality (e.g., having children), as a basis of attachment security, for self-esteem maintenance, and through worldview validation. In support of these views, many TMT studies have validated the compensatory function of close relationships.

Considering Mario Mikulincer's chapter in this handbook (Chapter 10), we will keep this review somewhat brief. To show that people turn to close others when mortality concerns are salient, several studies have demonstrated that thoughts of death lead participants to initiate interactions with strangers (Taubman Ben-Ari et al., 2002), to express greater sexual attraction toward others (Birnbaum, Hirschberger, & Goldenberg, 2011; Silveira et al., 2014; Śmieja, Kałaska, & Adamczyk, 2006), heightens their romantic beliefs (e.g., "love at first sight," Smith & Massey, 2012), and changes their standards of attractiveness in mate (Kosloff, Greenberg, Sullivan, & Weise, 2010; Landau et al., 2006). Additionally, following MS manipulations, participants become more romantically committed to their partners (Cox & Arndt, 2012; Florian et al., 2002) as measured by the Dimensions of Commitment Inventory (Adams & Jones, 1997). This scale taps into three distinct types of commitment: romantic (e.g., attraction, love), moral (i.e., sense of social obligation to one's partner), and fear commitment (i.e., costs associated with leaving the relationship).

Other relationship processes that MS has been found to increase include intimacy striving (Hirschberger, Florian, & Mikulincer, 2003; Mikulincer & Florian, 2000), the desire for romantic (vs physical) sex (Birnbaum et al., 2011; Goldenberg, Cox, Pyszczynski, Greenberg, & Solomon, 2002),

forgiveness (Van Tongeren, Hook, & Davis, 2013), perceived regard (Cox & Arndt, 2012), relationship satisfaction (Anglin, 2014; Miller, 2003), and a heightened memory bias for positive relationship partners (Cox et al., 2008; Wakimoto, 2011). Not only does MS increase jealousy and sexual risk-taking attitudes (Goldenberg et al., 2003; Lam, Morrison, & Smeesters, 2009; Taubman Ben-Ari, 2004), but imaging relationship conflict (Florian et al., 2002), activating thoughts of fear of intimacy (Taubman Ben-Ari et al., 1999), or being separated from a loved one (Mikulincer, Florian, Birnbaum, & Malishkevich, 2002) increases the accessibility of death-related thoughts.

DEATH-THOUGHT ACCESSIBILITY

Given that unconscious thoughts of mortality are central to a TMT perspective, it was important for researchers to develop methods of assessing DTA. Returning to the duel defense model of TMT, Pyszczynski et al. (1999) argued that explicit thoughts of death are initially suppressed but become accessible following a delay. To test this, Greenberg et al. (1994) created a word-fragment completion task to measure the accessibility of death-related thoughts. Similar to assessments utilized in priming experiments (Bassili & Smith, 1986; Gilbert & Hixon, 1991; Tulving, Schacter, & Stark, 1982), researchers reasoned that the way in which individuals complete a word fragment (e.g., GRA _ _) offers insight into whether mortality awareness is salient (e.g., *grave*) or not (e.g., *grant*). Stated differently, a greater number of words completed with death-related themes indicate heighted DTA, or an activation of implicit thoughts of mortality. To mask the nature of the scale, Greenberg et al. included 20 other word fragments that could only be completed with neutral, nondeath-related words. Participants are instructed to work through the questionnaire quickly, answering each fragment with the first word that comes to mind.

In two reviews of published DTA experiments (Hayes, Schimel, Arndt, & Faucher, 2010; Steinman & Updegraff, 2015), researchers have acknowledged that a majority of the work has used some variation of Greenberg et al.'s (1994) six-item world-fragment completion measure. As shown in Table 4.3, studies have assessed DTA using word-fragment tasks that range from 2 to 17 death-related word-stem items. There are also variations in the number of neutral words included in the task. Whereas many studies use 15–20 neutral fragments, this number can vary from 3 (e.g., Rutjens, van der Pligt, & van Harreveld, 2009) to up to 28 different items (e.g., MacDorman, 2005). As Hayes and colleagues have argued, although a greater number of death-related word fragments increase the sensitivity of the measure, this has the potential to increase the saliency of what one is trying to assess (in this case, death cognition). Additionally, while an increase in the number of neutral word stems may help to offset this problem,

experimenters should be aware of participant time, questionnaire length, and the presentation and order of materials. Word-fragment completion tasks have been translated into several different languages, attesting to the construct validity of this measure (e.g., Chinese: Zhou, Lei, Marley, & Chen, 2009; Dutch: Das, Bushman, Bezemer, Kerkhof, & Vermeulen, 2009; English: Greenberg et al., 1994; Hebrew: Mikulincer & Florian, 2000).

Another common approach to measuring DTA involves reaction times, including a lexical decision task (Arndt et al., 2007; Hayes, Schimel, & Williams, 2008; Schimel et al., 2007) or an implicit association test (Bassett, 2005). Participants during a lexical decision task are asked to make quick judgments about word strings as to whether they are a "word" or a "non-word." The rationale behind this type of experimental procedure is that if individuals are quick to respond to a category of words, then the category construct is highly accessible for such persons (see Bargh & Chartrand, 2000). With respect to TMT, participants should react more quickly and make fewer categorization errors in response to death-related words (relative to other word types) when thoughts of mortality are salient. This is supported by research demonstrating that the subliminal presentation of the word *cancer*, a disease often associated with greater mortality risk (Moser et al., 2014), is associated with a heightened accessibility of death-related thoughts (Arndt et al., 2007). An additional feature of using a lexical decision task is to assess different constructs simultaneously and to make comparisons. For example, returning to work by Arndt et al. (2007), researchers presented individuals with 60 trials, with half of the words being non-words (e.g., quert, fraw) while the remaining words were neutral (e.g., picture, tree), negative (e.g., danger, evil), or death-related (e.g., dead, skull). If the obtained results are specific to heightened mortality awareness, then researchers should expect an increase in DTA and not negative thoughts in general.[2]

There are other less common approaches to measuring the accessibility of death-related thoughts. For instance, Gailliot, Schmeichel, and Baumeister (2006) presented participants with one of two ambiguous images. In one study, the picture was of a female sitting in front of a mirror applying make-up, or looked at differently, an image of a skull. Alternatively, in another

2. If researchers decide to utilize an implicit measure of DTA (i.e., a lexical decision task, implicit association test), the best procedure is to purchase a reaction time software program (e.g., MediaLab, Inquisit). One benefit to using Inquisit (www.millisecond.com) is the online test library, where scripts from subliminal priming studies and lexical decision experiments are posted for download and modification. Following procedures recommended by Arndt et al. (2007) and others (e.g., Hayes, Schimel, Faucher, & Williams, 2008; Schimel et al., 1999), letter strings for the lexical decision task should be presented at 1000 ms with a forward and backward mask (xxxxx). Further, there are typically two strategies for dealing with outlying data—that is, latencies that are less than 200 ms or greater than 2000 ms (Bargh & Chartrand, 2000). Given that both reflect errors, such responses can be either dropped (Arndt et al., 2007) or recoded to 200 and 2000 ms (Schimel et al., 1999), respectively.

experiment, the picture could be perceived as a skull or of two men sitting at a table. In these studies, participants were told to list the first 10 words that came to mind when viewing the images and DTA was assessed by summing together the total number of death-related words listed. The results revealed that individuals experienced a heightened accessibility of mortality-related thoughts if they scored low (as opposed high) on measures of self-control (e.g., "I am good at resisting temptation"). Death cognition has also been assessed using fear of mortality scales (Bassett, 2005; Routledge & Juhl, 2010), by coding the number of death-related words used in participants' writing (Gailliot, Schmeichel, & Maner, 2007), and by analyzing people's verbal conversations with one another (Cox & Kersten, 2016). Considering the number of different ways in which DTA can be assessed, Steinman and Updegraff (2015) conducted a metaanalysis and found no significant difference in effect size estimates between word-fragment completion tasks and reaction time tests. Effect sizes also did not vary as a function of the number of mortality-related word stems included as part of the questionnaires.

Before ending this section, there are several methodological considerations that should be discussed. Fritsche et al. (2010) make a distinction between the use of implicit and explicit DTA measures. Partially structured scales (e.g., a word-fragment task), for example, use more deliberation as compared to spontaneous-related tasks (e.g., a reaction time assessment—information processing). Although both types of measures are automatic to a certain degree, deliberative scales have the potential of being influenced by controlled processes, such as self-presentation concerns. For instance, the mere act of completing a DTA assessment has the potential to prime MS given the heightened accessibility of death cognition. Hayes and Schimel (2018) found that exposure to a mortality-related word fragment task resulted in greater self-esteem striving after a delay relative to the completion of neutral words (see Zhou et al., 2008 for similar results on WVD). In a third experiment, researchers randomly assigned individuals to an MS manipulation (i.e., write about death vs dental pain), one of two DTA tasks (i.e., death-related vs neutral), and a delay period (i.e., delay vs no delay). The results revealed that reminders of mortality increased self-enhancement strategies among participants who completed the neutral word-fragments; this effect was eliminated for those who received a "double-death" prime (i.e., MS combined with DTA). Hayes and Schimel not only demonstrate that DTA has the potential to activate thoughts of mortality, but also this priming effect can obscure downstream effects when assessing for statistical mediation. This is especially important when trying to determine whether DTA is the primary mechanism by which MS produces defense.

Another methodological consideration involves the associative link between DTA and other mortality-related constructs. According to models of semantic memory (Collins and Loftus, 1975), given that several topics are related to death, priming such thoughts should increase the accessibility of mortality

awareness. For example, individuals have been shown to report heightened DTA in response to cancer (Arndt et al., 2007), illness (AIDS: Grover, Miller, Solomon, Webster, & Saucier, 2010; swine flu: Bélanger, Faber, & Gelfand, 2013), terrorism (the 9/11 attack: Landau et al., 2004; Islamic terrorists: Das et al., 2009), atheism (Cook, Cohen, & Solomon, 2015), risk taking activities (binge drinking: Jessop & Wade, 2008; unprotected sex: Taubman Ben-Ari et al., 1999; unsafe driving: Shehryar & Hunt, 2005), threats to meaning (Webber, Zhang, Schimel, & Blatter, 2016), and in response to body nature disgust (Cox, Goldenberg, Pyszczynski, & Weise, 2007; physical vs romantic sex: Goldenberg et al., 2002; physical disability: Hirschberger, Florian, & Mikulincer, 2005; old age: Martens, Greenberg, Schimel, & Landau, 2004). These studies thus suggest that topics associated with death (indirectly or directly) have the potential to increase the accessibility of mortality-related thoughts. Given that the results of death-association studies are parallel to findings produced by MS manipulations, researchers should consider the presentation order and timing of measures following such primes to assess proximal and distal defenses. Arndt et al. (2007), for instance, found that thoughts of cancer increased DTA but only after a delay.

Finally, in addition to death-association studies, much work has examined whether heightened DTA emerges as a function of threats to anxiety-buffering defense mechanisms. Whereas early TMT experiments demonstrated that thoughts of mortality increase people's need for worldview validation and self-esteem maintenance, other research explored whether attacking the integrity of the cultural anxiety-buffering system increased the accessibility of death-related thoughts. Stated differently, if a psychological structure provides protection against mortality awareness, then threatening this structure should increase DTA (i.e., the DTA hypothesis of TMT). In support, several studies have demonstrated that heightened death salience emerges in response to threats to relationship solidarity (Florian et al., 2002; Mikulincer et al., 2002), self-esteem (Hayes et al., 2008; Ogilvie, Cohen, & Solomon, 2008), and cultural identity or worldview beliefs (nationalism: Schimel et al., 2007; religion: Hayes et al., 2008). These types of experiments are not specific to college age samples as researchers have explored anxiety disruption and DTA concerns in breast cancer populations (Cox, Reid-Arndt, Arndt, & Moser, 2012), parents of children with autism spectrum disorder (Cox, Eaton, Ekas, & Van Enkevort, 2015), terminally ill patients (Edmondson, Park, Chaudoir, & Wortmann, 2008), and among trauma victims (Edmondson et al., 2011, see Chapter 19, this volume). Overall, a growing number of studies have demonstrated that individuals' experience heightened DTA in response to threats to the TMT anxiety-buffering defense system, regardless of whether mortality awareness is activated. Given that these types of manipulations do not increase explicit thoughts of death, but rather heighten DTA, studies should immediately assess outcome variables of interest after the presentation of such primes.

VARIABLES FOUND TO MODERATE MS EFFECTS

Having discussed the various ways to manipulate thoughts of mortality, along with a review of different outcome measures, the goal in writing this last section was to present some of the moderating variables found to influence TMT effects. We understand, unfortunately, that not every study can be reviewed in this final section. However, the aim here is to discuss results from several of the experiments that have been done, followed by design recommendations if one were to include variables of a moderating nature in a study.

Situational Primes

According to the anxiety-buffer hypothesis of TMT, if a psychological structure (i.e., worldview beliefs, self-esteem, and close relationships) provides protection against the awareness of death, then activating thoughts of this mechanism should ameliorate the effects of MS on subsequent attitudes and behavior. To initially test this idea, Greenberg et al. (1992) gave participants either positive or neutral personality feedback and then exposed them to gory accident footage (death prime) or a neutral film. Individuals then completed a self-report measure of anxiety (Studies 1 and 3) or galvanic skin response (Study 2). The results revealed that reminders of death led to increased anxiety in response to receiving neutral personality feedback but not positive evaluations. As an extension of this work, additional studies have found that situational primes and dispositional tendencies for higher self-esteem help to shield against the awareness of mortality (Arndt & Greenberg, 1999; Baldwin & Wesley, 1996; Harmon-Jones et al., 1997; Landau & Greenberg, 2006; Miller & Taubman Ben-Ari, 2004; Pyszczynski et al., 2004: Schmeichel et al., 2009; Taubman Ben-Ari et al., 1999), even at a neural level of analysis (Klackl, Jonas, & Kronbichler, 2014). Interestingly, Schmeichel and colleagues (2009) demonstrated that whereas responses to an explicit self-esteem questionnaire were associated with heightened defensiveness following reminders of death, an implicit assessment (either as a manipulation or a measure) led to decreased WVD and self-worth striving after MS.

A similar pattern of results has emerged when activating thoughts of a person's cultural worldview. That is, to the extent that belief systems serve to alleviate the potential for anxiety in response to reminders of death, then bolstering faith in one's worldview should buffer the effects of MS on defensiveness. In support, Schmeichel and Martens (2005) found that participants were less likely to derogate a worldview threatening other, and experienced lower DTA, following thoughts of death combined with the self-affirmation of an important held value. Similar TMT effects have been shown to emerge in response to thoughts of one's culture (Sullivan, Jonas, & Jodlbauer, 2011;

Wirth-Petrik & Guenther, 2012), religion (Friedman & Rholes, 2008; Jonas & Fischer, 2006), in-group (Halloran and Brown, 2007; Kneer & Rieger, 2016), sense of self (Routledge, Arndt, Sedikides, & Wildschut, 2008; Wojtkowiak & Rutjens, 2011), close relationships (Cox et al., 2008; Mikulincer et al., 2003; Wisman & Goldenberg, 2005; Zhou et al., 2009), socially held values (egalitarianism, humility, modesty: Du & Jonas, 2015; Gailliot et al., 2008; Kesebir, 2014), and through creative acts (Arndt et al., 1999; Routledge & Arndt,2009). In addition to forms of symbolic immortality (Florian & Mikulincer, 1998), people can achieve a sense of death transcendence by means of literal beliefs in an afterlife. Deschesne et al. (2003) found that participants were less likely to seek self-esteem defenses following reminders of mortality and an essay that presented scientific evidence in favor of life after death. Similar effects on WVD have been demonstrated among atheists primed with literal afterlife beliefs following MS (Heflick & Goldenberg, 2012).

Another commonly studied defense against the awareness of mortality involves activation of prosocial motives. For instance, in a study conducted by Gailliot et al. (2008), participants were randomly assigned to read about the value of helping in America (e.g., "Most everyone in the United States would say that it's important to help others") versus a control condition about a foreigner named Jeremy. Following thoughts of death, individuals were presented with a series of scenarios (e.g., donate money to a panhandler, children with illness) and were asked to indicate their level of helping. The findings demonstrated that MS increased people's willingness to help others in need but only when individuals were primed with the American value of helping (also see Halloran & Brown, 2007; Joireman & Duell, 2005; Jonas et al., 2002; Schimel, Wohl, & Williams, 2006). Although the aforementioned results suggest that reminders of death increase prosocial behaviors, another line of work demonstrates that MS leads to less compassion and greater victim blame toward individuals with disabilities (Hirschberger, 2006; Hirschberger et al., 2005). In support, Hirschberger et al. (2008) showed that participants were less willing to help a confederate after thoughts of death when she was seated in a wheelchair versus standing up. Because the physicality of the human body poses a threat to terror management defenses (i.e., being susceptible to illness and death), mortality awareness leads to stronger feelings of disgust toward body products and animals, along with a tendency to see ourselves as distinct from other species (see Chapter 9, this volume). This is supported by research showing that MS combined with human nature primes (e.g., creatureliness, breastfeeding, physical sex) leads to greater aversiveness toward the animal nature of humans (Beatson & Halloran, 2007; Cox et al., 2007; Goldenberg, Arndt, Hart, & Routledge, 2008; Goldenberg, Pyszczynski, McCoy, Greenberg, & Solomon, 1999).

Finally, several experiments have examined the moderating role of demographic characteristics within the TMT domain (e.g., age, gender, culture). Returning to the metaanalytic results of Burke et al. (2010), researchers found that participants' gender did not influence MS effects in experiments that explicitly explored gender differences or in single sex experiments. Although a gender effect did not emerge for this work, several studies have shown that males and females defend themselves in different ways depending on the variable being assessed after MS. For instance, research has demonstrated that thoughts of death increase the accessibility of nationalistic constructs for men and relationship constructs for women (Arndt, Greenberg, & Cook, 2002); leads males to find risk-taking to be more appealing while females do not (Hirschberger et al., 2002); and influences men's evaluation of seductively dressed opposite-sex others (Landau et al. 2006). Further, although older adults have been shown to be less defensive (Maxfield et al., 2007) and more generative (Maxfield et al., 2014) in comparison to young adults following reminders of death, metaanalytic results revealed that age was not a significant moderator of death salience primes (Burke et al.). One limitation of these findings is the restricted age range that was examined—that is, 68% of the reviewed studies included persons between 17–27 years of age. With respect to cultural background, MS manipulations have been found to have stronger effects among Americans as compared to Europeans, Israelis, and Asians (Burke et al.). One explanation for these findings is that the concept of death may be better integrated within non-Western cultures, rendering non-American participants more conscious of their mortality daily as compared to their American counterparts (Parkes, Laungani, & Young, 2015).

Individual Differences

In addition to examining the moderating effects of situational and demographic variables from a TMT perspective, important consideration should be made for personality characteristics. Individual differences that have been found to interact with MS include dispositional self-esteem (Harmon-Jones et al., 1997), DTA (Hayes et al., 2010), attachment style (Cox et al., 2008; Mikulincer & Florian, 2000), Big 5 personality characteristics (e.g., openness to experience, Boyd, Morris, & Goldenberg, 2017; neuroticism, Goldenberg et al., 1999), depression (Simon, Greenberg, Harmon-Jones, Solomon, & Pyszczynski, 1996), anxiety disorders (Strachan et al., 2007), religiosity (Friedman & Rholes, 2008), personal need for structure (PNS; Deschesne et al., 2000b; Landau et al., 2004), nostalgia proneness (Routledge et al., 2008), a dispositional sense of meaning (Routledge & Juhl, 2010), mindfulness (Park & Pyszczynski, 2017), broad autism phenotype (Arrowood, Cox, & Ekas, 2017), disgust sensitivity (Kelley, Crowell, Tang, Harmon-Jones, & Schmeichel, 2015), just world beliefs (Schindler & Reinhard, 2015), authoritarianism (Motyl, Hart, & Pyszczynski, 2010), creative

achievement (Perach & Wisman, 2016), and cultural differences (Ma-Kellams & Blascovich, 2012). While it is beyond the scope of this chapter to cover all of these individual differences, a few examples will be discussed in detail below (for a more in-depth review of individual differences see Landau, Sullivan, & King, 2010).

As Landau et al. (2010) argue, several personality characteristics can be understood with respect to their defensive capacity in response to reminders of mortality. For instance, Harmon-Jones et al. (1997) demonstrated that while individuals low on the trait of self-esteem responded to MS with greater WVD, dispositionally high self-worth persons did not. These findings have since been replicated with low implicit evaluations being associated with a pro-American bias (Schmeichel et al., 2009). Further, given that depressed individuals are often characterized by dissatisfaction with life while holding little faith in themselves or the world in which they live (Beck, 1967), they may not have the defense mechanisms in place to effectively manage the awareness of death. Indeed, Simon et al. (1996) demonstrated that mildly depressed individuals were more likely to respond to an MS manipulation with greater defense of their cultural worldview compared to nondepressed persons. Similar results have been obtained among individuals with phobic reactions to spiders and obsessive-compulsive hand-washing tendencies (Strachan et al., 2007). A final individual difference associated with pronounced rigidity in response to mortality concerns is neuroticism—that is, someone with a predisposition to anxiety and negative affect. Goldenberg et al. (2006) found that those high in neuroticism demonstrated increased avoidance of both good and bad bodily sensations given the connection between the human body and our animal nature (Chapter 9, this volume).

Although TMT suggests that individuals adhere to culturally derived belief systems and strive to live up to societal standards of value when death concerns are salient, there are individual differences in the way in which people obtain self-esteem and worldview validation. One of the most studied personality characteristics from a terror management perspective is PNS (see Chapter 5, this volume). Individuals scoring high on this trait exhibit a preference for clarity and structure with a corresponding avoidance of ambiguity. Research has demonstrated that people high, but not low, in PNS are especially likely to response to MS with increased defensiveness (Juhl & Routledge, 2010; Landau et al., 2004) and stronger adherence to cultural beliefs (Routledge, Juhl, & Vess, 2010). In contrast, low PNS persons are less protected against mortality concerns given an increase in death anxiety following MS in comparison to their high-scoring counterparts (Routledge, Juhl, & Vess, 2013). Variations in the meaning derived from worldview beliefs in response to death have also been found with respect to authoritarianism, political orientation (see, e.g., Greenberg, Solomon, & Arndt, 2008), and in response to culturally cherished values. For instance, Ma-Kellams and Blascovich (2012) found that East Asians endorsement of holistic thinking

(i.e., individual differences in the recognition of interconnectedness) led to a greater tendency to enjoy humor and life activities when confronted with mortality-related concerns.

As further support for the attenuation of MS effects as a function of personality characteristics, Niemiec et al. (2010) demonstrated that individuals' high in trait mindfulness (i.e., enhanced present moment awareness) did not show increased WVD, self-esteem striving, or DTA following thoughts of death. The opposite pattern of results was found for those low in mindfulness orientation. Park and Pyszczynski (2017) extended these findings to show that mindfulness mediation was capable of buffering death-related thoughts and reducing WVD among novice meditators. These results indicate that certain individual differences may also serve as a starting point for potential experimental manipulations. Finally, persons who are more prone to nostalgia, a sentimental longing for the past, show decreased DTA following MS, compared to those low in nostalgia proneness (Routledge et al., 2008). Nostalgia is thought to be an inner reservoir of meaningful experience that people can draw upon, which simultaneously increases their sense of meaningful existence while attenuating existential threats. A similar increase in meaning in life has been found among low PNS persons following reminders of death and a task where they imagined exploring an unfamiliar versus familiar topic (e.g., abstract art vs a shopping mall; Vess, Routledge, Landau, & Arndt, 2009).

From a design perspective, the optimal strategy for exploring the influence of personality characteristics in TMT effects is to collect individual difference data as part of a prescreen or separate survey. This, unfortunately, may not be possible, leading to some careful methodological considerations. On one hand, researchers can include filler questionnaires, along with the measure of interest, at the start of the study prior to the presentation of the MS manipulation. Not only does this lend to the cover story of the experiment, but it also prevents carryover effects that could potentially contaminate the death salience prime. On the other hand, however, there are instances where researchers may want to include individual difference variables at the end of the experiment, following the assessment of the dependent variable(s). This procedural process can prevent the activation of terror management defense mechanisms. For example, Hirschberger, Ein-Dor, Leidner, and Saguy (2016) measured participants' in-group identification near the end of their studies because the saliency of such thoughts could affirm one's sense of self and therefore bolster self-esteem simultaneously strengthening the anxiety buffer and decreasing distal defenses (i.e., support for armed conflict). In instances where individual differences are assessed near the end of the study, statistical analyses should be performed to ensure that the death manipulation does not influence the trait(s) being assessed.

There are also differences in the way that TMT researchers have introduced situational primes of a moderating nature in their experiments. Several studies,

for example, present the manipulation of interest immediately prior to the MS prime (Deschesne et al., 2003; Greenberg, Simon et al., 1992; Schmeichel & Martens, 2005). This contrasts with other studies which place the manipulation following reminders of death but prior to the assessment of the dependent variable (Cox et al., 2009; Florian & Mikulincer, 1998; Motyl et al., 2011). (A distraction task may also be placed between the MS manipulation and the situational prime, such as the PANAS and/or word search puzzle [Cox et al., 2008; 2009].) With respect to both situational and individual difference variables of a moderating nature, researchers should carefully consider whether such primes have the potential to affirm anxiety-buffering mechanisms and/or whether counterbalancing techniques should be utilized in the experimental design. The goal in writing these last paragraphs was not to add confusion in the content and ordering of terror management studies. Rather, considering the push for replication in social psychology and other fields of study (Lilienfeld & Waldman, 2017), it is important to have candid discussions about maximizing the reproducibility of research. One direction for future examination is to explore the frequency in which these different design features (i.e., ordering) are utilized in TMT work, and how they might influence statistical and practical significance (e.g., the magnitude of effect size estimates).

CONCLUSION

Terror management research, and the number of experimenters who conduct these studies, has grown significantly over the past 30 years. Not only has the theory been studied across a variety of different disciplines (e.g., psychology, marketing, communication, law, political science, robotics), but it has also been tested in over 30 different countries around the world (e.g., United States, Canada, Germany, France, Italy, Israel, Iran, India, Tibet, China, Japan, Korea, and Australia). Our goal in writing this chapter was to provide social scientists, both novice and experienced, a quick overview of the materials and methods utilized in TMT studies. Although we are excited by the work that has been done, we are equally looking forward to new methods that are on the horizon. For instance, the elicitation of death within a virtual reality environment (Chittaro, Sioni, Crescentini, & Fabbro, 2017), the use of mortality awareness as a treatment for psychopathology (Major, Whelton, & Duff, 2016), the impact of social media (e,g., Facebook, Twitter, Instagram) at eliciting thoughts of death (and alternatively, the use of social media to managing existential anxieties), the biological bases of mortality concerns (see Chapter 16, this volume), and understanding the psychological processes that occur at the moment of death (e.g., life review experience; Katz, Saadon-Grosman, & Arzy, 2017). Although there might come a time where TMT is superseded by a different perspective, the theory at present continues to make important strides in understanding the motivation behind human attitudes and behavior.

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Chapter 5

Terror Management Motivation Fuels Structure-Seeking

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Imagine waking up tomorrow to discover your mind has discontinued its habitual sense-making operations for a well-deserved break. Your senses are bombarded by an avalanche of colors, amorphous shapes, and signs that appear from some unknown place and vanish just as mysteriously. Everything seems dauntingly *new*. You can't get a purchase on what things will do, how their actions might affect you, or how you might influence them.

This rather fantastical scenario captures the essence of experiencing raw, unstructured reality. In light of this picture, the centuries-old perspective known as *naïve realism*—the idea that we apprehend reality as it is—starts to look, well, pretty naïve. A more accurate characterization of mental life is that we construct a meaningful conception of reality.

This idea has a long history in philosophy and psychology. The contribution of social psychology—particularly the subarea social cognition—is to articulate the mental processes, both conscious and unconscious, by which people make sense of things. The traditional focus, then, lies in answering the "How" question: What cognitive tools make meaning possible? The generally accepted answer is that meaning depends on the knowledge that one's social and physical environments have a clear and stable *structure* or order. This structure is the product of various cognitive strategies by which people continually filter information, elaborate on it, distort it, and generally reorganize it into simple, clear, and coherent interpretations.

Yet an equally important question is "Why"—What psychological function is served by structure? One standard account, developed by pragmatist philosophers (Dewey, 1925; James, 1890) and emphasized by social psychologists (Fiske, 1992), is that structure serves practical goals. If people want to order a pizza, court a potential mate, or dodge the latest virus going around, they need to categorize things, make guided inferences, and piece together

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events into predictable patterns. *Thinking is for doing*, the argument goes. A related account holds that structuring processes conserve a limited supply of mental energy. Lacking the capacity to attend to and process every aspect of their environment, people orient toward things that appear well-defined, lean on comfortable beliefs, and filter out the leftover complications. In short, establishing structure is a practical necessity for engaging the social world from each moment to the next.

Despite their intuitive appeal and empirical support, however, these functional accounts may be incomplete. A complementary insight is offered by terror management theory (*TMT*; see Chapter 1, this volume): structuring one's environment and experience serves a *distal* psychological motive of buffering the anxiety-provoking awareness of mortality. To elaborate, TMT proposes, at one level, that people assuage mortality concerns by subscribing to a *cultural worldview* that offers routes to immortality (like an afterlife or memorable accomplishments) and maintaining *self-esteem*, the feeling that one is living up to cultural standards of value and hence eligible for continued existence beyond physical death.

At a more basic level, though, these entwined psychological structures are built around an infrastructure of nonspecific, domain-general conceptions of reality as comprehensible and orderly. Structuring processes furnish these bedrock conceptions, continually feeding our conscious minds with a taken-for-granted vision of the environment as composed of identifiable stimuli that afford reliable transactions. Conversely, *lacking* these conceptions would nullify *any* attempt to achieve death-transcending meaning and self-esteem, regardless of the particular immortality recipe offered by the local worldview. People would be compelled to see their life for what it objectively is: a shifting collage of *stuff*; a heap of ephemeral moments; an arbitrary series of chance events and intersections devoid of any necessity, coherence, or purpose.

Put simply, a terror management account of structure-seeking converges with the mainstream notion that thinking is for doing, but it furnishes a deeper understanding of what people are *trying to do*. On top of getting to work in the morning and navigating life's practicalities, they are trying to be cultural heroes. A well-structured world provides reliable routes to heroism; a chaotic world does not.

If this account is correct, then motivating people to be heroic—by means of inducing mortality salience (or *MS*)—should increase their preference for well-structured interpretations of other people, events, and their own experience. Also, threatening (or affirming) sources of structure should increase (decrease) the accessibility of death-related ideation and moderate the effects of MS on other compensatory processes. These hypotheses are supported by over 25 years of empirical research conducted in labs across the world with demographically diverse samples and wide-ranging methods (for earlier reviews, see Greenberg, Landau, & Arndt, 2013; Landau, Kay, & Whitson, 2015; Landau & Sullivan, 2014). Collectively, these studies demonstrate

far-reaching consequences of motivated structure-seeking for such diverse outcomes as person perception, attitudes, self-concept organization, and time perception.

To organize this large and growing literature, we separately review studies pertaining to one of three epistemic goals, broadly defined as a desire to achieve and maintain particular types of knowledge:

- Seek *simple* interpretations and reduce complexity.
- Seek *consistent* relations between cognitions and reduce contradiction and ambivalence.
- Seek *temporal order* by perceiving events as connected in stable patterns, rather than as disconnected and hence arbitrary.

This review is not comprehensive, nor is it meant to tie a given finding to just one epistemic goal. In reality, tendencies to simplify, resolve inconsistencies, and integrate events work in concert to support the sense that the world is a structured place. Still, this organization underscores our cardinal point: even many "basic" processes—those traditionally viewed as built-in features of our standard cognitive system—function to ward off the ominous specter of mortality.

First, though, will thoughts of mortality increase structure-seeking equally across individuals? Previous research shows that people vary in their structuring goals. Some are desirous of simple, clear-cut knowledge and averse to uncertainty, and some tolerate (and even celebrate) uncertainty, mystery, and change (Rokeach, 1960; Kruglanski, Webster, & Klem, 1993; Neuberg & Newsom, 1993). Researchers capture this interindividual variability with measures like the Personal Need for Structure Scale (PNS), assessing agreement with statements such as: "It upsets me to go into a situation without knowing what I can expect from it" and "I enjoy having a clear and structured mode of life" (Thompson, Naccarato, Parker, & Moskowitz, 2001).

These individual differences may interact with terror management motivation. Prior articulations of TMT posit that although a worldview is largely culturally derived, it is also deeply personalized (Greenberg, Solomon, & Arndt, 2008). That means each individual adapts elements of the prevailing worldview to assemble his or her own understanding of how to live a life of enduring value. Supporting this claim is abundant evidence that individual differences in various personality traits (e.g., neuroticism, attachment style) are useful for predicting the different sources of meaning and value people characteristically cling to for security (Landau & Sullivan, 2014). Thus, although our account suggests that people have a universal need to impose at least some structure onto the world, individuals with a stronger preference for clear-cut knowledge—as measured with scales like PNS—may be especially likely to invest in structured knowledge as a preferred means of managing mortality concerns. Hence, they will be more likely to respond to MS with increased preference for well-structured interpretations of social information.

SIMPLIFICATION

Even within familiar surroundings, people are bombarded by information at a head-spinning velocity. Further complicating matters, many stimuli are ambiguous and open to multiple interpretations. Thus, a prerequisite of everyday meaning-making is reducing the sheer quantity of information to manageable proportions.

How do people accomplish this? Social and cognitive researchers converge on a standard story (Bruner, 1957; Fiske & Taylor, 2008; Moskowitz, 2005). The person classifies a given stimulus as an instance of some category (e.g., lumping a person into the category *librarian*). Next they access a repository of knowledge about that category—knowledge stored in the form of a schema. Schemas can include beliefs about attributes of category members, expectations of what they are like, and plans for how to interact with them, if at all. Categorizing and schematic processing simplify by diverting the informational stream into familiar channels and filtering out the complicated bits.

TMT enriches this standard account by explaining how simplification buffers mortality concerns. Cultural worldviews inform individuals about what things in their environment are like—what their features and properties are and how they relate. These shared representations are the building blocks of the worldview's larger narrative about life's meaning. They enable one to confidently categorize stimuli, make judgments, and generally transact with things in a culturally approved manner. Without lumping stimuli into categories and filtering them through schemas, people would be overloaded with information that goes beyond prevailing cultural representations. Such complexity would undermine confidence in the worldview's validity and furthermore impede efforts to bring one's conduct in line with cultural standards. Let's look at some tests of this reasoning.

Categorizing

Again, simplifying begins with categorization, answering the basic question "What *is* this?" If categorizing facilitates terror management, then MS should exaggerate it. As a case study, take judgments of group membership. Imagine Jane is shuffling rapidly through profiles on an online dating app. She's looking for a vegetarian, but none of these guys mention their dietary preferences. She could categorize on the basis of complex statistical information, consulting Google for the stats on single male vegetarians in a 50-mile radius. But research shows she's more likely to make knee-jerk judgments based on *representative* information—descriptions that fit well-worn cultural expectations (Tversky & Kahneman, 1973). She figures that a guy who, say, does yoga *has* to be a vegetarian; hence, "swipe right." Research confirms that MS heightens this tendency to seize on representative information in making group membership judgments. When a target was described as

"athletic, interested in social justice issues, and the first person in his family to go to college," mortality-salient participants were 70% sure he was African American, even though they were told there was only a 30% chance he was (Landau et al., 2004; Study 2). Categorization is more than a trick to save mental energy; it is also a means of arranging others into neat and stable groups, thereby reinforcing the categories that partially constitute one's worldview.

Subsequent research examined the flip side of that same coin, testing whether MS increases aversion to stimuli that resist categorization. Landau, Greenberg, Solomon, Pyszczynski, and Martens (2006) built on prior evidence that most people dislike modern, abstract art on account of its failure to present recognizable forms or objects (Cupchik & Gebotys, 1988). They hypothesized on the basis of TMT that this aversion stems from a deeper urge to avoid *any* intimation of chaos that threatens to undermine one's cultural heroism projects. Therefore, MS should decrease liking for modern art, particularly among high-PNS individuals, unless something else in the context renders the artwork interpretable.

In one study, participants contemplated death or pain before evaluating a visually disordered Jackson Pollock painting. Critically, half viewed the piece with its actual title—*Guardians of the Secret*—while the other half instead got the nondescript *#12. Guardians of the Secret* directs attention to recognizable forms: the vertical figures pop out as the titular "guardians" protecting the "secret" white box; oh, and there's a guard dog at the bottom! As predicted, high-PNS participants primed with MS were especially averse to Pollock's mishmash, but not when the same piece was given a meaningful title (Fig. 5.1).[1]

In a follow-up study, MS reduced liking for a chaotic Kandinsky painting among high-PNS participants, but not if they were first asked to imagine themselves being lost in an unfamiliar city. Presumably, this imagined experience provided a frame of reference for interpreting what the painting intends to "say." By showing that MS increases aversion to stimuli that resist categorization, and that facilitating categorization eliminates this aversion, these studies demonstrate the terror management function of securing simple interpretations.

Stereotyping

It is well known that thinking with stereotypes simplifies the social world by downplaying others' idiosyncratic characteristics and basing judgments on generalizations associated with their perceived group membership

1. For ease of presentation, Figs. 5.1, 5.2, and 5.5 depict the predicted means of PNS (high vs. low) at ± 1 *SD* from the centered mean. In all corresponding studies, PNS was analyzed as a continuous variable using multiple regression.

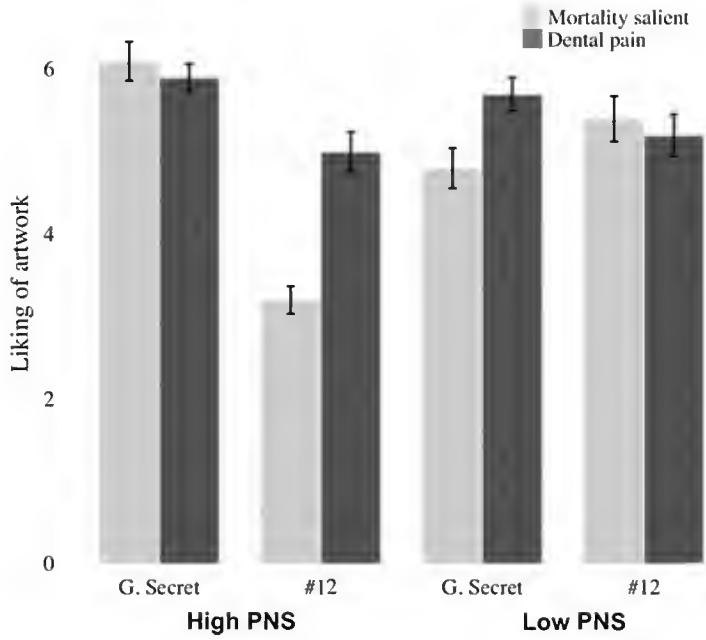


FIGURE 5.1 Mortality-salient, high-PNS individuals disliked chaotic artwork unless it had an explanatory title. Scale ranged from 0 to 9. Error bars represent ± 1 *SE* (Landau et al., 2006).

(Hamilton & Sherman, 1994). Indeed, traditional perspectives claim that is what stereotyping is *for*—to conserve a limited supply of mental energy (Macrae, Milne, & Bodenhausen, 1994). Although energy-saving is certainly a key motive, Greenberg et al. (1990) claimed that stereotyping may also function to affirm the culture's dominant group portrayals and, in this way, strengthen one's death-denying worldview. Accordingly, they showed that Christian participants responded to MS with stronger endorsement of stereotypical descriptions of Jewish targets (e.g., as miserly).

Schimel et al. (1999) provided an even stronger test of this claim. They reasoned that if endorsing simplifying stereotypes strengthens one's worldview, then MS should increase the appeal of even *positive* stereotypes of outgroups. This is because positive stereotypes, although potentially implying that one's own group is inferior by comparison, still afford simple conceptions of others and the social world more generally. In one study, Americans who were reminded of their mortality were more likely to describe Germans (relative to other Americans) using *both* positive stereotypical attributes (e.g., "hardworking") and negative attributes (e.g., "unemotional"). This was perhaps the first study to demonstrate that MS motivates nonspecific structuring independent of the directional, pro-worldview defenses that were the focus of first-generation TMT research. Put differently, when White

Americans laud Germans as industrious, Italians as stylish, or Asians as math whizzes, they may not be enhancing the value of their ingroup, but they do simplify the social world by reducing unique individuals to a narrow set of clearly defined attributes.

One question then becomes, does MS lead everyone to stereotype? No. Schimel et al. (1999) showed that after MS people liked a target described in stereotype-consistent ways versus one who didn't fit the mold (e.g., a gay man who acts in an effeminate vs masculine manner), but only if they were predisposed to generally think in simple, definitive terms (measured with the Need for Closure Scale; Kruglanski, et al., 1993).

Aside from biasing social judgments, what are other practical repercussions of stereotyping? One answer is that it can hold people back from achieving their full potential. To see how, consider the experimental scenario created by Landau, Greenberg, and Rothschild (2009a). In a classroom setting, female undergrads were administered a purported test of mental spatial rotation. The experimenter told one group that their test performance would help researchers understand women's inferiority at mental rotation compared to men (a standard stereotype threat induction; Spencer, Steele, & Quinn, 1999). MS was manipulated, as was test difficulty, with one version presenting difficult items, the other easy items. The researchers reasoned that mortality-salient women given an easy test would be conflicted, at least implicitly. On the one hand, an easy test means an opportunity to show off their brilliance and even defy an offensive stereotype; on the other hand, to excel would violate a stereotypic expectation for their group. Put differently, by knocking the test out of the park, women would threaten their own worldview, muddying an otherwise simple, generally accepted scheme for who is good at what. Predictably (albeit sadly), MS led women to underperform on the easy test—putting the brakes on an excellent performance that would fly in the face of a simple stereotype. In contrast, MS did not affect performance on the difficult test, presumably because women were not conflicted about what they could do versus what they're stereotyped to do.

Simplifying the Self

Throughout the day people navigate in and out of various social contexts, each of which calls up certain styles of thinking and acting (Showers & Zeigler-Hill, 2007). Erin is *cunning* in her job as a statistician, *nurturing* with her younger sister, *reverent* when worshipping, *aggressive* on the basketball court, and *silly* with her friends. Although having a large buffet of characteristics may be adaptive, it can pose an existential problem. Reflecting on all the different "selves" she embodies, Erin wonders "Who am I at the core?" Lacking a well-defined self-concept, she cannot confidently judge whether she qualifies for her culture's immortality plan.

Based on this reasoning, Landau, Greenberg, Sullivan, Routledge, & Arndt (2009c; Study 3) predicted that MS would increase people's preference for simpler self-conceptions, particularly if they are predisposed to seek well-structured knowledge. After reflecting on their death or a comparison topic, participants completed a card sort task developed by Linville (1985) and Showers (1992). In brief, they're instructed to bring to mind a context-dependent "self" (e.g., *me-with-family*), flip through 20 cards labeled with characteristics and pick which describe that self; then shuffle the deck, call up another "self" and pick its defining characteristics. Those who prefer self-concept simplicity should specify *few* selves and describe them using mostly the *same*, recycled characteristics, while those who see themselves as more complex should generate *many* selves and describe them with *distinctive* characteristics. As predicted, MS increased high-PNS participants' preference for simplicity as reflected in fewer, more redundant self-descriptions. A person cannot evaluate herself as a cultural hero if she can't get a simple grasp on who she is.

CONSISTENCY

We're beginning to see how effectively coping with mortality concerns requires, in addition to the well-known strategies of worldview defense and self-esteem striving, relatively more basic social-cognitive tendencies to structure the world. The findings reported thus far indicate that one means of creating this bedrock structure is simplification—boiling down the ocean of available information to familiar categories with well-defined properties. Still, everyday life confronts us with an additional epistemic challenge: situations where things *don't fit with each other*, even when they are defined in simple ways. Paul observes a co-worker acting aloof one moment and kind the next. Alicia betrays her pro-environmental values by tossing recyclable cans in the trash. Rachel is ambivalent about her marriage, describing it as a "love–hate" relationship. Nader second-guesses a career move, going back and forth until he's paralyzed by indecision.

In general, the person experiencing inconsistency perceives this state as unpleasant and is thereby motivated to reduce it. This claim is the starting point of such influential perspectives as cognitive dissonance theory (Festinger, 1957), balance theory (Heider, 1958), and self-verification theory (Swann, 1983). Supporting evidence shows that inconsistency evokes physiological signs of aversive arousal as well as activity in brain areas involved in the detection of cognitive conflict (Harmon-Jones & Harmon-Jones, 2008). Little surprise, then, that people strive zealously to reduce inconsistency, even going so far as to distort reason and deny their direct perceptions (Abelson, Aronson, et al., 1968).

But why, at a deeper level, is inconsistency aversive? Common sense, and psychological theory, tells us that it interferes with practical goal pursuit.

TMT supplements these perspectives with a less intuitive but more provocative answer. People assuage mortality concerns by believing that their life follows a recipe for attaining lasting value. They want a guarantee that what they are doing is the right thing to do. Different cultural worldviews satisfy this desire by prescribing specific formulas for how to think, feel, and act. But regardless of the specific *content* of one's worldview, maintaining consistency among its parts is a prerequisite for effectively warding off terror. This analysis suggests that MS will exaggerate efforts to maintain consistent relations among one's cognitions.

Consistency in Beliefs, Actions, Traits, and Values

In an early test of this broad hypothesis, Jonas, Greenberg, and Frey (2003) asked German participants to read about a controversy surrounding German health insurance policies and then judge which of two different policies should be implemented by the German parliament. After making a preliminary decision, they were given a list of additional resources (e.g., newspaper articles with headlines biased one way or the other) and asked to indicate which, if any, they might be interested in reading. MS increased preference for novel and more detailed information, but *only* if the headlines were consistent with participants' initial decision. This finding extends prior research on worldview defense by demonstrating that MS can drive people to actively seek *new* information as a means of maintaining consistency between thought and action.

Still, it is unclear whether this effect reflects an urge for nonspecific consistency or motivated defense of a particular political viewpoint. What is needed is a conceptual replication examining whether people seek consistency with regards to less culturally sensitive topics. Friedman and Arndt (2005) provided just that in their study of MS effects on cognitive dissonance reduction. Adapting a classic induced-compliance procedure, they asked participants to write a counterattitudinal statement (describing a boring task as extremely interesting) under conditions of either high or low choice. Prior research shows that acting in opposition to one's attitude arouses dissonance, which is reduced by changing that attitude to align it with the action. In this context, reevaluating the boring task as interesting restores attitude-behavior consistency. Results replicated this basic attitude change effect, and moreover showed that it was exaggerated under conditions of MS. Harmonizing attitudes and actions is not something people just do, like a built-in "app" of human cognition; it is motivated reasoning and behavior fueled by the need to uphold the cognitive infrastructure of the cultural worldview and the self-esteem it affords.

Conceptually related research examines people's efforts to maintain consistency between their personal traits. Researchers have shown that people possess a wide range of self-descriptions that are cued by shifting social

contexts—together these form the so-called working self-concept (Markus & Kunda, 1986). But that's not how people generally prefer to view it. The current account helps explain why: With so many diverse traits potentially summing up the self, one risks viewing the self as a tangle of contradictions—silly *and* serious, cautious *and* risky, quiet *and* outspoken—with no center of narrative gravity and, hence, no clear path to immortality. To test this, Landau et al. (2009c; Study 2) presented participants with bipolar traits presented along continua. Campbell (1990) developed this task so that the traits in each pair are equivalent in social desirability. For example, *competitive* was paired with *cooperative*. Neither is particularly self-enhancing, but they describe contradictory personality traits. Describing oneself in the middle of these pairs means tolerating (or even embracing) contradictions in the self. But if MS heightens a desire for consistency, then it should lead people to avoid those contradictions and view themselves as embodying one or the other trait, thus rating themselves closer to either end of the continua. This is exactly what was found. Still, the question persists: even though the traits were selected to be equal in valence, is this effect just MS-induced self-enhancement? Probably not. MS polarized self-views among participants high, but not low, in PNS, and there is no reason to believe that low-PNS individuals are less prone to self-enhancement. Also, the effect was eliminated if participants were given the opportunity to clearly define their traits prior to the dependent measure.

Related studies focus on personal values. From a TMT perspective, values serve as bridges between the culture's abstract standards of worth and one's conduct in the here and now. Calling up a value to guide behavior enables one to do whatever is required to be "good." This helps to explain the averseness of holding conflicting values. Take Jason, who envies a close friend's financial success. He has mixed feelings about acting on that envy. On the one hand, he knows his own culture values competition and special recognition; on the other hand, his culture also values selflessness. Like Shakespeare's Hamlet deliberating over whether to act or not, Jason is frozen in indecision. He lacks comprehension of what is being called for and how he might respond to that call. That's an unnerving state, according to TMT, because it signals that *there is no* reliable path to immortality. Thus, emphasizing which values are most important when faced with reminders of death may help to restore a clear and structured sense of self, buffering against the potential to experience anxiety.

Blackie, Cozzolino, & Sedikides (2016; Study 2) tested this hypothesis by manipulating MS and then asking participants to rate 57 different values (Schwarz, 1992) in terms of how important each was as a "guiding principle" in their lives. When mortality was not salient, participants were quite comfortable viewing conflicting values as equally important guides. They said, for example, they value *connectedness* but also *solitude*; they seek to be *daring* and *creative*, yet cherish *tradition* and *conformity*. By contrast,

participants reminded of their mortality were less tolerant of such inconsistency. They rated as most important those values that cluster together; particularly those that emphasize connections with enduring cultural standards and similar-minded others.

Consistency in Person Perception

Terror management motivation lies behind a preference for consistent interpretations of other people, as well as the self. In one study (Landau et al., 2004; Study 1), participants were asked to read two opposing descriptions of a target, counterbalanced in order: one described him as introverted, the other as extraverted. Afterwards, they were asked to report their impression of the target's overall sociability. Those previously reminded of mortality (versus an aversive comparison topic) were more likely to describe the target in line with whichever description they had seen first (the well-known *primacy effect*). MS apparently motivated them to perceive others as acting in consistent ways, so they seized on their first impression and ignored subsequent information that conflicted with it.

A follow-up study tested whether MS decreases liking for individuals who act in inconsistent ways (Landau et al., 2004; Study 3). Participants read an ostensible transcript of a conversation between people sharing their observations of the same target individual behaving in different social contexts, ranging from the classroom to the bar. Depending on the condition, the target came across as consistently introverted, consistently extraverted, or as behaving in both manners willy-nilly from one context to the next. As predicted, MS led high-PNS participants to strongly dislike the inconsistent target (Fig. 5.2).

As in the case of interpreting an individual's actions, people generally prefer to perceive broader social relationships as consistent. Fritz Heider's (1958) balance theory is useful for modeling how triads of social elements (e.g., individuals, events, objects) relate to one another, and how the type and configuration of those relations can create an overall sense of cognitive harmony or discord. Building on Heider's theory, Landau et al. (2004; Study 4) had participants read social scenarios with balanced or unbalanced relations. For instance, one scenario described two people who like each other (a positive relation) and both dislike a third object (two negative relations). When those relations are psychologically "multiplied," the product is positive—i.e., *balanced*. In the unbalanced version, one friend liked the object while the other didn't, producing an overall negative charge. As predicted, MS increased preference for the balanced scenarios, but only among participants high in PNS.

Together, these findings provide converging evidence that cognitive efforts to maintain consistent interpretations of the social world facilitate terror management motivation. They also join the other reviewed studies to

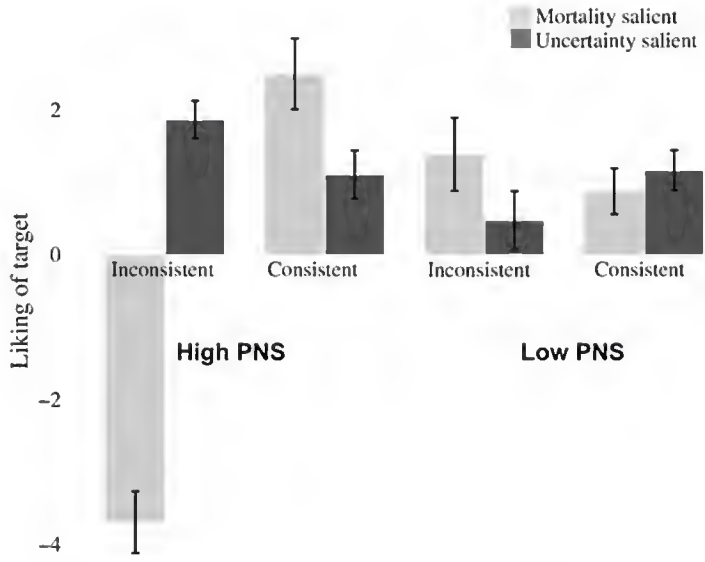


FIGURE 5.2 Liking for target as a function of MS, target behavioral consistency, and PNS. Scale ranged from −9 to +9. Error bars represent ± 1 *SE* (Landau et al., 2004).

demonstrate the importance of individual differences in structure-seeking for predicting when mortality concerns will and will not affect cognitive structuring outcomes.

TEMPORAL COHERENCE

So far we've described the human quest for structure in terms of construals of *form*—the shape of things and how they fit together (or don't). Form underpins faith in the worldview and its tenants, but on its own is not sufficient for the purposes of terror management. The person also needs to make sense of *change*—how and why events are set into motion and unfold over time. To the extent that a person has clear conceptions of how events cause one another, fit into overarching themes, and shape good and bad outcomes, they can confidently navigate the world to establish their special, enduring status. Otherwise, they find themselves in an Alice-in-Wonderland reality where anything can happen, at any time, for reasons they cannot fully anticipate or control. In such a world, *any* immortality striving is doomed to fail. This analysis suggests that MS will heighten efforts to view events and experiences over time as fitting into coherent patterns. Also, information or situations that threaten those patterns—that intimate randomness—should bring mortality concerns closer to the forefront of consciousness. This analysis has sparked several new directions in TMT research. Below are some highlights.

Order in Personal Experience

Understanding one's life depends in large part on integrating memories of past events with one's current situation and into a coherent narrative (McAdams, 2001). One needs to see the past as setting the stage for the present, not as radically disconnected. In the absence of this continuity, for example, as Erik Erikson (1958, p. 111) put it, the individual "selectively reconstruct[s] his past in such a way that, step by step, it seems to have planned him, or better he seems to have planned it." Without viewing past and present experiences as fitting into a coherent pattern, the person is faced with the disturbing realization that life is merely a series of isolated moments. If this is correct, then MS will motivate people to perceive stronger ties between past experiences and their current self-concept.

Testing this idea, Landau et al. (2009c; Study 5) had participants generate a list of autobiographical memories from various times in their lives and then, following an MS manipulation, indicate which of those experiences had a formative influence on the way they viewed themselves today. As depicted in Fig. 5.3, participants used pen and paper to draw connections between what they felt to be formative events and a larger box labeled "Current Self." If an event struck them as an isolated episode with no important link to their current self, they were instructed to draw no line. As predicted, high-PNS participants responded to MS by drawing more connections between past events and their current self, whereas their low-PNS counterparts did not show this effect. Furthermore, this effect did not depend on whether the events were positive or negative in valence, suggesting that MS did not simply increase general efforts at self-enhancement. If that were the case, participants both high and low in PNS would have been expected to highlight connections between positive memories and their current self.

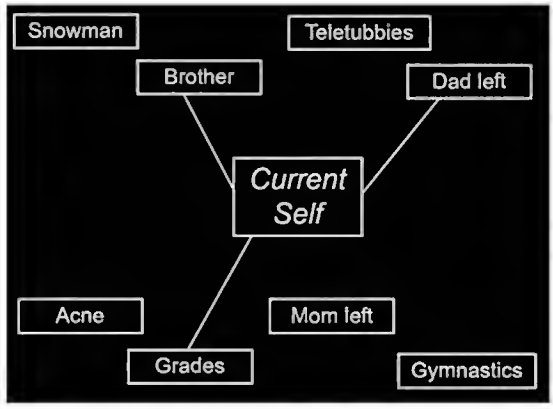


FIGURE 5.3 Graphical representation of the task used to measure perceived connections between past events (represented as keywords) and the current self-concept.

Instead, high-PNS participants simply connected *more* past events to their current self regardless of whether they involved the agony of *the mega-zit on prom night* or the rewards of *Thanksgiving with my Uncle.*

These findings suggest that terror management motivation drives people to view life's events as parts of a coherent progression, not a bunch of serendipitous happenings, especially among those predisposed to prefer well-structured knowledge. To further examine this, Landau, Kosloff, and Schmeichel (2011) hypothesized that MS would prompt people to connect their current actions and their long-term goals, integrating *who I am* not only with *who I was*, but also with *what I am becoming*. Participants were asked to list personal goals that they hoped to achieve within 40 years, as well as what activities they had planned for the upcoming week. After being primed with MS, but not another aversive threat, participants were more likely to view their current actions as connected in meaningful ways with their future goals. With mortality concerns resonating in consciousness, even a mundane visit to the library takes on enhanced meaning as a step toward accomplishing one's long-term goal of becoming a doctor.

The two studies just mentioned operationalized temporal coherence broadly, leaving it up to the participants themselves to interpret what constituted a meaningful connection between events and identities separated in time. Related studies take a closer look at different kinds of coherence. Take *causal* coherence. Action—and by extension, culturally valued action—presupposes causal relations—between agent and actions, between agents and the effects of actions, and so on. Causal order forms the basis of predictability, and is what allows us to construct structured conceptions of the world and ourselves (McAdams, 2001). On this basis, Habermas and Bluck (2000) propose that autobiographical coherence is primarily maintained through organizing one's experiences into cause–effect relationships. Susie recognizes that her child was born *because* of her previous decisions and experiences, not merely in addition to them.

Building on this work, Landau et al. (2009c) hypothesized that if causal coherence serves terror management goals, then MS should increase the tendency to view one's experiences as causally linked. Participants were primed with mortality or personal uncertainty before writing about their day as if writing in a personal journal (the study took place in the evening, ensuring that participants would have had some events to reflect on). Their narratives were analyzed for the prevalence of words implying cause-and-effect (e.g., "because") using the Linguistic Inquiry and Word Count software (Pennebaker, Francis, & Booth, 2001). As predicted, MS led people high in PNS, but not low, to spontaneously use a greater percentage of causal words in their narratives.

If temporal coherence is derived from viewing events as causally linked, then those seeking coherence should feel as though changing one event in a sequence would significantly alter the course of future events. Conversely,

those more comfortable viewing events as only loosely dependent will perceive that things would be pretty much the same if that target event had never happened. This reasoning led Landau et al. (2011) to study what they termed *existential counterfactuals*: how would deleting an event from your personal history alter who you are today and the life you live? Participants primed with mortality were more likely to perceive that, had a particular episode never occurred, they would be radically different today. Presumably MS motivated them to perceive personal events as linked in an orderly causal chain. They wanted to see each event as integral to their life story, not as an inconsequential bit of happenstance. Consistent with this line of reasoning, the effect disappeared when participants were instead asked to think counterfactually about the past experiences of imagined *others*. Maintaining causal coherence across one's experiences bears no relation to the goings-on of fictional characters, and so should not respond defensively to existential counterfactuals for other people's lives.

The foregoing analysis further suggests that threats to autobiographical coherence (e.g., perceiving one's experiences as disordered) will instigate compensatory efforts to restore a sense of life's meaningfulness and predictability. In a study testing this possibility (Landau, Greenberg, & Sullivan, 2009b) participants high and low in PNS were asked to write about 20 past events and then organize them in one of three ways: chronologically; thematically (e.g., "Accomplishments"); or arbitrarily, based on alphabetizing keywords representing those events. The third condition frames those past experiences in a way that is temporally incoherent, ignoring the causal and thematic connections that otherwise make those events meaningful.

Insofar as autobiographical coherence facilitates terror management, scrambling autobiographical connections should lead high-PNS individuals to compensate by reaffirming the orderliness of time in some other way. So, Landau et al. (2009b) had participants sketch out a series of future events onto a timeline, using shapes to represent how rigidly structured those events would be (Fig. 5.4). If they anticipated that (say) lunch with Chris will begin and end at definite times, they were instructed to represent that event on the timeline using a rectangle; but if the event was seen as having fuzzy or provisional temporal boundaries, they should represent it with an oval. As predicted, high-PNS participants primed with mortality and confronted with a scrambled past compensated by projecting structure on their future, envisioning upcoming events as having definite temporal boundaries.

Order in External Events

Aside from seeking causal coherence, people establish a structured life story by *thematic* coherence—integrating experiences around general themes and valued principles, such as "life is loving" (Habermas & Bluck, 2000). Recognizing recurring themes helps the person to contextualize their life

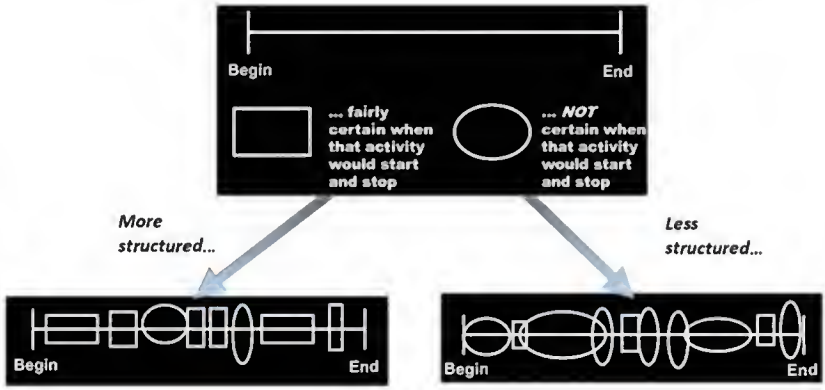


FIGURE 5.4 Materials used to measure structuring of future time (Landau et al., 2009b). Participants instructed to represent future events on a timeline using well-bounded rectangles or loosely defined ovals. Greater use of rectangles reflects desire to impose definition onto time.

within larger cultural narratives. From the perspective of TMT, thematic coherence clarifies which ideals are valued by society, and reassures the individual that their actions contribute to those lasting sources of meaning.

To assess this analysis, Agroskin and Jonas (2013) tested whether MS increased the perception that separate events cohere around a common theme. Participants read 10 social scenarios from a first-person perspective and rated how interrelated the events within each one were. In one scenario, for instance, the reader imagines finding a friend's voodoo doll at a party then "causing" another party-guest to become warmer by placing the doll near an electric heater. As predicted, the researchers found that MS led participants to perceive greater causal coherence between these unrelated events described in such scenarios. This finding shows how MS motivates people to organize their perceptions of external events around both thematic and causal information (e.g., voodoo dolls having magical powers).

This research points to a broader strategy for maintaining structured conceptions of reality: to perceive things in the world as unfolding in a predictably benevolent manner—what is commonly known as belief in a just world (Lerner, 1980). A 'just world' entails that if we live up to all the right moral standards and cultural prescriptions, bad things won't happen to us; it also means that those who break the rules will eventually get what they deserve. Faith in these ideals—justice, fairness—affords a stable sense of death-transcendence, as they imbue one's meaning-making efforts and social interactions with security and predictability. Thus, according to TMT, people should be motivated to maintain the view that there exists some generally benevolent order in the world, especially under conditions of MS.

In one study, Landau et al. (2004; Study 7) primed high- and low-PNS participants with death or a control topic and had them read two summaries

of movie scripts. In one summary, a protagonist witnesses his apartment building burn down and then, through a series of totally unrelated events, falls in love. The other script describes the initial fire as setting off a chain of events which lead the protagonist to meet his love, emphasizing the relationship between the initial tragedy and subsequent redemption. Although both scenarios contain the same negative and positive outcomes, reminders of death led high-PNS participants to prefer the "bad *causes* good" scenario over the "bad *simply precedes* good" scenario. For those individuals, MS led to clearer preferences for coherent narratives that affirm the essentially benevolent structure behind life's happenings.

What happens, though, when people encounter information suggesting that the world is not *just*—that good people suffer while bad people prosper? Research shows they often restore faith in benevolent order by viewing victims as somehow deserving of their suffering (Lerner, 1980). In line with our current analysis, studies show that MS exacerbates this victim blaming tendency. In one study, Landau et al. (2004) had participants read about a senseless tragedy in which a college student was disfigured in a random attack (Study 5). After an MS manipulation, the participants were given an opportunity to read summary statements about the victim, with themes implying either positive or negative information about him (e.g., *Jeff often had mean things to say about others*). If negative information serves to make the victim look like a bad person who was deserving of the attack in some way, this would help to reaffirm the nonspecific belief that events unfold according to a just, benevolent order. As depicted in Fig. 5.5, high-PNS individuals reacted to MS by requesting to see more disparaging information about the victim of a senseless tragedy.

In another study, Landau et al. (2004; Study 6) focused on how MS affected participants confronted with positive information about the victim of a tragic event (e.g., *[Jeff] was actively involved in community service*), given that it conflicts with the core belief that bad things don't happen to good people. Previous research testing the death-thought accessibility (DTA) hypothesis (see Chapter 1, this volume) showed that worldview-relevant threats increase the accessibility of death-related cognitions. Accordingly, high-PNS participants exposed to positive, but not negative, information about the victim showed greater DTA as indexed by more death-related completions of ambiguous word fragments (e.g., completing "DE_D" as *dead* rather than *deed*).

Hirschberger (2006) broadened this research by further testing the hypotheses among samples of Israeli participants. In one study, MS led to greater blaming of innocent victims who were described as suffering a physical disability versus those who sustained a mild injury or were merely clumsy. From a TMT perspective, people with severe physical disabilities may pose an implicit threat to just-world beliefs that otherwise buffer against death anxiety, thereby motivating defensive victim blaming. A follow-up

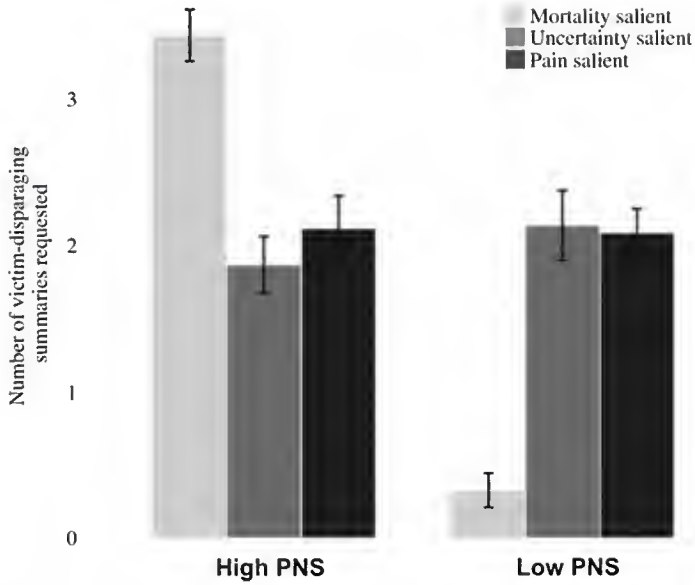


FIGURE 5.5 High-PNS individuals requested more information disparaging the victim of a senseless tragedy if they had just contemplated their own death. Scale ranged from 0 to 5. Error bars represent ± 1 *SE* (Landau et al., 2004).

study showed that exposure to unjust events increased DTA particularly when the victim was perceived as innocent and severely injured. Taken together, these findings suggest that, at least for high-PNS individuals, the belief that victims of tragedy get what they deserve and deserve what they get is an important part of the cognitive infrastructure that protects people against mortality concerns.

SUMMARY AND OUTLOOK

The various studies reviewed converge to expand the empirical, theoretical, and practical scope of TMT. Empirically, we observe that MS increases not only investment in specific aspects of one's worldview and self-concept, but also *nonspecific* efforts to attain simple, consistent, and orderly conceptions of the social and physical world. Moreover, temporary threats to these sources of structure heighten the accessibility of death-related cognition, further suggesting their death-denying function. Theoretically, this work suggests that terror management is a full-time occupation. Upholding a meaningful and value-conferring worldview is not something one has to do only when faced with a political opponent or member of a rival sports team; it's an ongoing cognitive effort to demarcate parts of the world and assemble

them into reliable, predictable patterns. Practically, these findings suggest that relaxing people's urge for structure—and thus attenuating potentially harmful biases and heuristics such as victim blaming—requires more than boosting processing capacity or mental energy; it also requires alternative means of coming to terms with one's deep-seated existential insecurities.

Still, we continued to see that individuals who preferred clear and confident knowledge (as measured with PNS or NFC) were particularly likely to cling to well-structured interpretations under MS. Those low in dispositional structure-seeking were typically unresponsive to MS, and in a few cases moved in the opposite direction toward *less* structuring. This pattern fits with other findings in the TMT literature: Dechesne, Janssen, and van Knippenberg (2000) exposed participants to criticism of their university ingroup and found that MS led those low in PNS to *reduce* identification with that group, while those high in PNS actively defended it. Given that university affiliation can itself be a potent source of self-enhancement (Cialdini & Richardson, 1980), distancing oneself from that valued identity seems to run counter to defending against threat. Not only does it reveal an indifference toward structure-seeking, but it is an active rejection of otherwise meaningful connections to the larger culture. These findings raise the question of how low-PNS individuals cope with mortality concerns. Are they using other alternative psychological strategies of defense, or are they simply less threatened by their existential situations? These questions have been dealt with elsewhere (Greenberg et al., 2013; Landau & Sullivan, 2014), so we only touch briefly on them.

While many studies reviewed here only demonstrate an *absence* of structure-seeking among low-PNS individuals, other research has shown that, in some circumstances, these individuals actively *seek out* novel experiences and creative worldviews to defend against mortal concerns—sometimes at the expense of retaining ambiguity and uncertainty, or perhaps even *for* it. Though these conditions may be threatening to some, this does not entail that people low in PNS are any more prone to death-anxiety and feelings of meaninglessness than their structure-seeking counterparts. Rather, they may affirm their own immortality projects by emphasizing the innumerable possibilities that make life unpredictable and thereby poised, at any time, to evince unthinkable wonders. The excitement of embracing ambiguity, treading into unknown territory, and keeping an open mind in new situations may, for this personality disposition, serve the same terror management function as does clinging to familiar schemas and narrative structures among avid structure-seekers.

Vess, Routledge, Landau, and Arndt (2009) were one of the first to systematically explore the novelty-seeking hypothesis, building on the idea that low-PNS individuals may be attracted to new experiences as a means of terror management. Accordingly, in one experiment reminders of mortality led them to report greater interest in documentaries promoting novel cultural

perspectives, such as the challenges of being a Chinese immigrant in American society. Moreover, a follow-up study showed that MS exerted these effects most strongly when low-PNS individuals had high death-thought accessibility; meaning they were most interested in exploring unusual ideas and meeting new people when existential concerns were bubbling just below the threshold of consciousness.

These results show that low-PNS individuals tend to seek novelty in response to MS. But we should also expect novelty-seeking to improve their sensation of meaningfulness, if it is indeed an effective form of terror management. Two additional studies support this idea. Vess et al. (2009) found that people low in PNS, after contemplating their mortality, reported greater meaning in life after picturing themselves searching for information about an unfamiliar—but not *familiar*—topic. They also reported *more* meaning in life after engaging in existentially counterfactual thinking about autobiographical events.

Clearly, individual differences in structure-seeking are connected with radically divergent responses to existential threat. These differences, however, reside at a very basic motivational level; they do not say anything about the *specific* worldviews or standards that one may adopt—rather, they say something about *how* the individual engages with those narrative structures in order to give life meaning. Complementing the impressive body of work that demonstrates how specific worldview-defense strategies serve terror management goals (e.g., derogating an outgroup member), the present chapter highlights people's fundamental motives to impose structure on the world in a nonspecific, generalized fashion. These motives are assumed to be universal, even among those with seemingly little interest in simple structures. This is because even relatively domain-specific modules for perception are deeply entrenched in cultural learning and social development. The fact that we think—and even sometimes *perceive*—abstractions on the basis of symbols reveals our dependence on structured knowledge for interacting with the world in meaningful ways.

Reflecting back on our structure-indifferent friends, we may still wonder *why* novelty-seeking behaviors serve epistemic goals for defense and security. How does the rejection of structured thought serve a terror management function? One possibility is that people low in PNS simply practice affirming *different kinds* of structures. Routledge and Juhl (2012), for example, found that low-PNS people were more likely to show heightened levels of creativity and creative processing after MS. Creativity is a skill, and a culturally valued one, that involves combining different percepts and structures into new configurations. It is not something that necessitates a "pure" rejection of structured thought, or "pure" novelty; it often involves blending relatively identifiable components into some new object or function. A rock suddenly becomes a paperweight; an old shirt suddenly becomes a sweatband; and a coat hanger suddenly looks like a great radio antenna. In all of these cases, we rely on some pre-existing structures and ideas to build something new.

Taken together, it is clear that low-PNS individuals are not "immune" to death-anxiety or existential threat, and that they need at least *some* structure on which to scaffold a reliable sense of life's meaning. Self-directed expressions of creativity—even the transgressive and seemingly anti-social—are still forms of structure-seeking. That is, rejecting or derogating *specific* structures may nevertheless be motivated by a more basic drive for nonspecific structure; the drive to clear away the old and make room for the new. Needless to say, it remains important work for terror management researchers to study the intricacies of low-PNS individuals and their unique strategies of existential defense.

Whether one is driven to simplify all the buzzing confusion of the world, or to appreciate its diversity and complexity, everyone relies on some form of structure in order to derive meaning from it. Future research on the interface between TMT and motivated structure-seeking will benefit from continuing to probe these individual differences and attempting to understand how epistemic goals are balanced when not all can be met at once. How do people make trade-offs between the motive to reduce complexity and that to maintain consistency, for instance? Studies focused on illuminating the connections between specific worldviews and nonspecific structure-seeking will be valuable contributions to the TMT account of basic human motivation.

Across the studies reviewed in this chapter, we've seen how our existential condition shapes even the most seemingly automatic and unthinking processes. A structured world offers something, *anything*, that can be used, recycled, and even rejected to afford the individual with a more stable foundation for her own construction of life's meaning. By carving up reality in a way that is comprehensible and manageable, we make meaning possible—we make *life* possible. TMT highlights the basic motives behind why people do what they do, and shows us that even some of our most "hard-wired" drives and abilities play a crucial role in how we think about life, death, and the ultimate value of our own existence.

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Chapter 6

We Supernaturals: Terror Management and People's Ambivalent Relationship With Nature

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We are supernaturals. Physically and psychologically humans have left the sphere of nature in the course of their evolutionary history. They have changed woods and savanna, first for temporary camps, and then, for enclosed settlements. In industrialized countries, today, a vast majority of citizens live in urban environments, enabling a life that is quite distant from nature and determined by the rules of human community and technology rather than natural forces. But what is "nature"? The very fact that we distinguish between "us" and "nature" indicates that humans have not just distanced physically from nature but also *psychologically* moved to a different place. Humans inhabit a cultural universe, which they contrast to the realm of nature and draw a solid line between them and close evolutionary relatives, "the animals" (Goldenberg et al., 2001).

Humans' relationship to what they call "nature" is characterized by deep-rooted ambivalence. On one side, nature is considered a material and psychological resource, something to exploit and to sustain, to recreate in, or even to identify with. On the other hand, nature, and the principles we associate with it, is a source of fear, disgust, and outrage: "wild" nature bears uncontrollability, uncertainty, and death. Also, it is the counterpart, and a lingering threat, to human culture where humans set laws of justice against laws of individual fitness. Distancing and ambivalence may have not just led to alienation from nature. They are also discussed as a precursor of our species' tendency to deplete its natural resources and destroy its natural habitat (Clayton, 2000).

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Terror management research (TMT; Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000; Greenberg, Solomon, & Pszczysnki, 1997) provides a fresh and provocative look on human ambivalence toward nature. In fact, this ambivalence touches upon the very core of TMT, which assumes that a huge part of people's social cognition and behavior is motivated by wiping out their awareness that they are mortal beings. Therefore, humans create cultural standards of value that provide the grounds for people attaining personal significance and thus symbolic death transcendence by acting in accordance with these standards. The standards are shared and validated within human groups and thus can vary from group to group. Furthermore, they depend on which of the multiple collective norms is salient in a situation (Giannakakis & Fritsche, 2011). Some have argued that defining the self as a group member (in terms of "We" instead of "I") is sufficient to mentally transcend a mortal self (Castano & Dechesne, 2005). Although valuing nature, or specific parts of it, is an important norm in many social groups, nature may always inherently remain the antagonist of culture and may thus endanger humans' palliating and liberating existence as cultural, "supernatural" beings.

In this chapter, we will first sketch the ambivalent meanings of nature for humans and how this ambivalence can be explained in terms of TMT and related models of human social motivation. Then, we will review 15 years of empirical, mostly experimental, research on terror management and ambivalence toward nature. This encompasses work on humans' tendency to distance themselves from nature (e.g., from animals), their denial of randomness and missing purpose in natural processes, (dis-)liking of nature and wilderness, and the impact of personal and collective norms about nature and environmental protection. Finally, we will sketch how this research advances the understanding both of terror management processes and of how to foster ecologically responsible attitudes and behavior.

AMBIGUITY OF NATURE

There are different definitions of nature. According to the Oxford English Dictionary, one of them defines "nature" as "the phenomena of the physical world collectively; esp. plants, animals, and other features and products of the earth itself, as opposed to humans and human creations" (Oxford English Dictionary, 2003). Although defining nature as including or excluding humans has always been a philosophical and ideological issue (Devall & Sessions, 1985; Dunlap, Van Liere, Mertig, & Jones, 2000; Scerri, 2016), it is remarkable that humans came up with the idea of distinguishing human-made and "natural" environment at all. Differentiating between conspecifics and others seems functional for knowing with whom to potentially mate or compete over the same resources. Also, at a quite basic level, for these reasons, within-species interactions will often differ from interactions across

species boundaries and might thus be given special consideration. However, the distinction between human culture and nature is much more than that. It implies confronting different principles of how life is organized. As Nick Haslam's (2006) research on dehumanization suggests, humans dissociate from animals on the dimensions of civility (vs lack of culture), refinement (vs coarseness), moral sensibility (vs amorality and lack of self-restraint), rationality and logic (vs irrationality and instinct), as well as maturity (vs childlikeness). Nature is often associated with immutable, preprogrammed natural laws that, applied to living creatures, result in egoistic striving for pleasure and continuous struggle for individuals' self-extension and survival, which is determined by both chance and biological fitness but not by planning or justice. The resulting patterns often appear chaotic and cruel. Human culture, instead, is meant to be built on rules of civility and justice. Although there is some variation across cultures and interaction types in what exactly is considered just (Fiske, 1992), cultural rules are usually thought as being set up by humans, or allied godheads, generating order, predictability, and thus control as well as they transcend merely personal interest or biological drives. That is, they stand in contrast to immutable egoism and uncontrollable chaos attributed to nature.

Nature as a Material and Psychological Resource

Humans' relationship to nature is complex and ambivalent (Konijnendijk & van den Berg, 2012; van den Berg & Ter Heinje, 2005). Most obviously, to begin with, nature provides plenty of material resources and specific natural settings have (had) instrumental value for humans. In their evolutionary history, humans developed considerable mastery in exploiting their natural environment for food and materials, which is often attributed to increasing intellectual capacity and social organization (Brewer & Caporael, 2006). People's desire to exploit natural resources does not just lead to positive affect toward exploitable elements of nature (e.g., a water rich in fish). Also, it may contribute to their often quite strict distinction between humans and other living beings. This distinction allows people to justify the exploitation of animals and plants by excluding them from a common scope of justice (Bilewicz, Imhoff, & Drogosz, 2011; Opotow, 1995).

Our ancestors developed a preference for those natural habitats that served their needs. As an animal that was both predator and prey, humans are likely to have taken advantage of places that allowed them to see without being seen (Appleton, 1975). This led to the evolution of innate landscape preferences that still affect modern humans' attitudes toward different types of natural surroundings or designed nature, such as it has been discussed for urban parks or other green spaces (Fisher & Nasar, 1992; Jorgensen, Hitchmough, & Calvert, 2002). Even more so, it has been found that contact to *any* elements of nature increases human well-being and health (Beute &

de Kort, 2014). For instance, people who live in green areas or only have a view of natural areas from their window showed increased recovery from illness (Ulrich, 1984) and reduced mortality (Mitchell & Popham, 2008). Health effects of nature have been explained in terms of stress-reducing and attention-restoring effects of natural surroundings (van den Berg, Joye, & de Vries, 2012).

Nature as an Object of Care

Although humans developed strategies to sustainably manage renewable resources such as fish in a lake or arable soil, rapid population and economic growth has repeatedly led to degradation of natural environments and resulting cultural decline at different places and across human history (Diamond, 2011). Today, the extent of environmental crises has markedly increased, encompassing global phenomena, such as climate change, loss of biodiversity, or soil degradation (IPCC, 2013; Rockström et al., 2009). Thus, today, the view that nature is an object that deserves protection and care (Schultz, 2001) has been proliferating across the globe. Conservation and pro-environmental behavior have become prescriptive norms in most countries (Milfont & Schultz, 2016). Of note, 76.4% of the participants in the World Values Survey (2017), wave 2010–14, indicated at least "somewhat" approval of caring for nature and saving life resources and 48.1% even indicated that "protecting the environment should be given priority, even if it causes slower economic growth and some loss of jobs" (vs 42.5% approval of the reversed priority statement). Beyond general pro-environmental social norms, environmentalism has become an important political ideology leading to the founding of internationally operating environmental action groups and political parties. The perception of pro-environmental norms fosters people's pro-environmental attitudes and behavior (Nolan, Schultz, Cialdini, Griskevicius, & Goldstein, 2008).

Nature as a Provider of Identity

Humans do not just exploit and care, inhabit, or live close to nature. Moreover, people also *identify* with places (Droseltis & Vignoles, 2010) and elements of the natural environment. Objects of identification might be elements that characterize the place people live at, such as the silhouette of the local mountain chain or the huge linden tree at the village square, or elements of nature that symbolize valued personal or collective attributes, such as the domestic eagle as a symbol of power and freedom. Some researchers have argued that (many) people may also feel connected to nature as a whole (Clayton, 2003; Mayer & Frantz, 2004). Both specific and more generalized forms of identification with nature go along with pro-environmental concern (Schultz, Shriver, Tabanico, & Khazian, 2004) and behavior (Clayton, 2000).

Nature Can Threaten Predictability and Control

Despite the tangible and intangible prospects and benefits nature offers to humans, nature may be inherently threatening at the same time. Not only that wilderness may expose individuals to physical dangers (e.g., it might be the habitat of poisonous animals and plants) and inconveniences (e.g., only slow movement possible) or that resources are poorly accessible. Furthermore, as nature is associated with chaos and the invalidation of human rules and morals, it may mean unpredictability and control loss for humans. Indeed, studies show that those groups of people who are most dependent on, and at the mercy of, nature, such as farmers hold the least favorable attitudes toward nature (van den Berg, Vlek, & Coeterier, 1998).

Nature as a Reminder of Human Mortality

Natural organisms not just reproduce but they die. This continuous natural process of renewal may serve species to biologically adapt to changing environmental conditions (Mitteldorf, 2010; Yang, 2013) but it does so at the expense of individuals' personal survival. For prehistoric humans, living in communities and hunting animals inevitably provided plenty opportunities to learn about the reality of death. With increasing capabilities of anticipating, simulating, and planning their future, they learned as well, that they would personally share the fate of deceased community members, of the hunters' kill, and even of rotten trees. That was the point in evolutionary history when reflecting on their creaturely nature may have created a potential for paralyzing terror in people, which terror management theory (Greenberg et al., 1997) suggests to be the birth of anxiety buffer mechanisms, powerfully affecting people's motivated cognition and social behavior up to our present days.

A TERROR MANAGEMENT LOOK AT HUMAN–NATURE RELATIONS

Discovering the inevitability of personal mortality on the ground of nature observation and inference could have ended the human journey. At that time, humans were self-conscious animals who had attained a considerable degree of mastery over their environment through social coordination and superior planning skills, expressed, for instance, in the (collective) ability to hunt large game or to effectively protect from predators. However, learning that despite all skillful striving and planning, they would not be able to preserve their very self, the ultimate reference point of all motivation, bore the root of anxiety and depression, impeding human functioning. An animal that is occupied with ruminating about how to escape an unescapable threat may

lose the capacity to effectively interact with the environment (Abramson, Seligman, & Teasdale, 1978; Gray & McNaughton, 2000).

Terror management theory (Greenberg et al., 1997) assumes that humans found a strategy that proved extremely successful in silencing the paralyzing concern about their personal mortality. Put simple, people were just drowning the reality of being mortal beings by mentally placing themselves in a different, supernatural world, which is the realm of culture. Culture provides standards of value and striving that are independent of the mortal self and do not depend on other individuals' personal fate, as they are sustained by groups and societies and their institutions. Culture even transcends nature that is the ultimate source of existential threat. In the cultural realm, instead, cultural, not natural, laws rule. Being valuable in the cultural world does not equate with sustaining physical life and reproduction, like it would in the realm of nature. Instead, it depends on how well people satisfy the cultural standards of value, which is, according to terror management theory, the source of people's self-esteem (Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). For defining the self as a cultural being, and thus buffering existential anxiety, people need to establish and defend cultural standards of value (cultural worldview defense) and to strive for personally accomplishing these standards (self-esteem striving). Also, just defining the self as a group member (e.g., identification with the national in-group) might be sufficient to symbolically escape the mortal world as groups are collective entities that live on even when individual members die (Castano, Yzerbyt, Paladino, & Sacchi, 2002).

There is mounting evidence supporting the notion of cultural anxiety buffers, as reported in more detail in other chapters of this volume. For example, building on the mortality salience paradigm, reminding people of their own death increases the defense of cultural worldviews (Burke, Martens, & Faucher, 2010), self-esteem striving (Pyszczynski et al., 2004), and in-group identification (Castano & Dechesne, 2005). At the same time, threatening the validity of cultural worldviews or personal self-esteem heightens the accessibility of death-related thoughts (Schimel, Hayes, Williams, & Jahrig, 2007). Of importance, people do not become generally destructive or aggressive when mortality is salient. Instead, they become ethnocentric, meaning that they adjust their thinking and behavior to a referent in-group. Thus, the direction in which mortality salience affects people's behavior depends on which cultural community (i.e., social identity; Giannakakis & Fritsche, 2011) and which in-group norm are salient in a situation (Jonas & Fritsche, 2012, 2013; Jonas et al., 2008). For instance, following mortality salience (vs TV salience) English students derogated French people more when their English identity had been made salient. In contrast, mortality salience *reduced* derogation when the English students had been made to think about their European in-group. Similarly, Jonas et al. (2008) found that mortality salience either increased or decreased the amount of money people donated

for a charitable cause depending on whether they had been subtly reminded either of the concept of altruism or of egoism.

A terror management perspective on human–nature relations proposes that people define themselves as cultural beings and thus put themselves outside the natural sphere to deny their biological mortality. At the same time, humans define the principles of the cultural, or civilized, world by contrasting them to those of nature. Thus, holding negative attitudes toward nature may serve to affirm the validity of people's cultural beliefs. But rejection of nature may not just help humans to create a supernatural and thus death-transcendent level of existence. Moreover, it may help to satisfy basic motives of uncertainty reduction (or meaning maintenance; Proulx & Inzlicht, 2012) and control (Fritsche, Jonas, & Fankhänel, 2008) that have been proposed to be intimately related to existential threat elicited by the awareness of inevitable personal death. For empirical evidence, manipulations of (self-concept) uncertainty and salient lack of personal control have, in certain domains, been shown to elicit effects similar to those of mortality salience (Fritsche et al., 2013; Proulx, Inzlicht, & Harmon-Jones, 2012) and to moderate MS effects on ethnocentric responses (Fritsche et al., 2008; Hohman & Hogg, 2015). For instance, thinking about controlling personal death through self-determined dying (vs personal death without self-determination information vs neutral condition) eliminated the classic mortality salience effect on measures of in-group bias and group-based action intentions (Fritsche et al., 2008). Given the importance of reducing uncertainty and maintaining control under conditions of existential threat, people may reject nature and its laws just for wanting to live in a nonchaotic, predictable, and controllable environment, provided by the laws of culture (vs nature).

EMPIRICAL EVIDENCE FOR TERROR MANAGEMENT PROCESSES IN HUMAN–NATURE RELATIONS

Although much has been found out in the past 30 years about the various ways in which people cope with existential threat on a cultural level of existence, the complementary basic process of distancing from nature has just received moderate attention. As a noteworthy exemption, and initial step into this direction, Goldenberg et al. (2000) investigated how terror management concerns affect people's attitudes toward their own body (see Chapter 9, this volume). They discovered indications of increased ambivalence toward the body when mortality was salient, such as disgust toward body products (Goldenberg et al., 2001) or less positive attitudes toward breast-feeding women (Cox, Goldenberg, Arndt, & Pyszczynski, 2007). Further findings suggest that these effects can be explained in terms of distancing from personal corporeality and human's animal nature. They show that mortality salience effects on ambivalence toward the body (e.g., the physical aspects

of sex; Goldenberg, Cox, Pyszczynski, Greenberg, & Solomon, 2002; e.g., breast self-exam intentions; Goldenberg, 2005) were most pronounced when humans' cultural existence was symbolically threatened by making the similarity between humans and animals salient. In a similar vein, women self-objectified (here, mechanistic self-dehumanization) more in response to mortality salience when reminders of biological reproduction (e.g., image of a pregnant women, request for a tampon) were salient (Morris, Goldenberg, & Heflick, 2014). It seems as if people distance from their corporeal, and thus mortal, nature to control existential anxiety.

We Are Supernatural: Distinguishing Humans From Animals and the Natural Sphere

It is one of the most basic corollaries of a terror management perspective on human–nature relations that people claim a cultural instead of a natural or biological existence for themselves. Increased ambivalence toward their own body or the human body in general as a response to mortality salience might be an immediate expression of this motivation. Mortality salience may affect attitudes toward animals and their relation to humans, as well. In fact, it not only increased people's explicit disgust toward animals (but not toward other potential objects of disgust; Goldenberg et al., 2001; Study 1; Bassett & Sonntag, 2010) and led to more negative attitudes toward animals (at least for people low in self-esteem; Beatson & Halloran, 2007), but also increased people's approval of an essay claiming that humans are distinct from other animals (but not of one stating that humans and animals were similar; Goldenberg et al., 2001; Study 2). People do not just increase distancing from animals under conditions of mortality salience. Also, there are indications that salient similarity between humans and animals increases the accessibility of death-related thoughts (Motyl et al., 2013), particularly in combination with reminders of people's creatureliness, such as thinking about the physical aspects of sex (Goldenberg et al., 2002) or watching pictures of human body products (Cox, Goldenberg, Pyszczynski, & Weise, 2007). Also, priming human–animal similarity elicits defensive cognition and behavior. For instance, US university students reduced their support for military force against Iran when they were exposed to a text asserting that human and animal aggression were quite similar (vs different vs a neutral content condition) and thus aggression would be an indication of humans' animal nature (Motyl et al., 2013; see also Motyl, Hart, & Pyszczynski, 2010).

Dominant ideologies, such as religions, developed that entail the separation of humans from nature or even place humans above nature. Initial research indicates that this "ingredient" is important for supporters to reduce existential anxiety. Accordingly, Vess, Arndt, and Cox (2012) showed that high levels of death-thought accessibility or experimentally elevated salience

of mortality led to an increased negative association between Christian fundamentalism and a sense of personal connectedness to nature. Obviously, when motivated to control existential threat, religious fundamentalists more strongly drew on the norms of their religious in-group that separate them from nature.

Fighting Chaos and Maintaining Control: Defensive Responses to Threatening Nature

As the counterpart to culture, nature bears the potential of chaos, unpredictability, and lacking human control. At least this should be true for those parts of nature that are not cultivated or designed and for natural processes that highlight randomness (e.g., random mutation and combination as driving evolutionary processes) and immutability (e.g., laws of physics). In its most extreme form, this becomes obvious in natural disasters, such as flooding or earthquakes.

Compensatory Control

As known from the literature on control loss, people may cope with situations of uncontrollability by means of secondary, or compensatory, control (Landau, Kay, & Whitson, 2015; Rothbaum, Weisz, & Snyder, 1982; Stollberg, Fritsche, Barth, & Jugert, 2016), serving as an indirect way to restore or maintain a general sense of control. That is, when primary control through the self seems futile, people seek to interpret events in a way that suggests general predictability and controllability. Asking victims of 2005 Hurricane Katrina and of the 2010 Chilean Earthquake why they thought the disaster happened revealed various explanations that go beyond natural processes (Stephens, Fryberg, Markus, & Hamedani, 2013). Of note, 35% and 34% of participants explained the events as an act of God. Other explanations in terms of obvious or hidden purpose (e.g., to bring people together, to morally clean the city) were mentioned with frequencies between 8% and 31%. Of importance, God explanations were most frequent in those survivors who had experienced most extreme events of unpredictability and uncontrollability. These field results resemble laboratory findings that mortality salience and salient threat to personal control increase the belief in supernatural agents, such as Gods (Norenzayan & Hansen, 2006), particularly when Gods are described as controlling (Kay, Whitson, Gaucher, & Galinsky, 2009). People seem to cope with the existentially threatening qualities of nature by interpreting natural events as purposeful and thus potentially controllable. This was tested in a study by Rutjens, Van Der Pligt, and Van Harreveld (2010) in which people were asked about their preferences for different theories explaining the origin of life. Although the vast majority of participants preferred a classic evolutionary theory explanation (i.e.,

evolution as determined by random processes) over intelligent design, this preference was significantly reduced when threat to personal control had been (vs had not been) made salient. A similar pattern occurred when the intelligent design option was replaced by a deterministic version of evolutionary theory, proposing that evolution is not random (i.e., if replayed, evolution would lead to a similar world as the present one): Salient threat to personal control reduced people's disapproval of deterministic versus classic evolutionary theory. These results support the notion that people tend to deny randomness as a principle of nature, particularly when motivated to buffer threat to personal control and existence. In turn, these results are first indications that its inherent, needs-depriving randomness is contributing to human's ambivalence toward nature.

Besides assigning meaning and purpose to threatening encounters with nature, people may respond with increased endorsement of general belief systems that the world is an orderly place. This is indicated by results of Kastenmüller, Greitemeyer, Hindocha, Tattersall, and Fischer (2013) who found that participants who had been exposed to pictures related to death, terrorism, or natural disasters scored higher on general justice sensitivity than those who had been shown neutral pictures.

Group-Based Control

Experiencing a threat to personal or, more general, human control may not just motivate the construction of order and predictability and thus the delegation of control to external systems or agents of control, such as gods (i.e., secondary control). Over and above this, recent research suggests that in situations when people's general sense of control seems threatened they mobilize their *social* self to maintain an overall sense of being autonomous and efficacious agents (Fritsche, Jonas, & Kessler, 2011; Stollberg et al., 2016). Groups are usually defined as agentic entities (Brewer, Hong, & Li, 2004) and thus may provide a sense of agency of the self, when personal agency seems futile. Specifically, under conditions of threatened personal control, people have been shown to be more biased in favor of their in-group versus out-group (Fritsche et al., 2011) and to identify more with (agentic) social in-groups (Fritsche et al., 2008; Stollberg, Fritsche, & Bäcker, 2015). Also, they increasingly act in line with in-group norms (Stollberg, Fritsche, & Jonas, 2017). Of importance, they even do this when in-group norms imply social change and liberal values, suggesting that these responses are indeed group-based efforts of control restoration rather than just indications of rigidity and system defense. This analysis suggests that experiencing uncontrollable and threatening nature may lead people to stick to their own group and to engage in collective endeavors.

Indeed, several recent findings indicate general ethnocentric responses to threats from the natural sphere. Specifically, Fritsche, Kessler, Cohrs, and

Bauer (2012) manipulated the salience of threatening climate change by asking samples of German and British students to indicate whether they already knew about a list of predicted national consequences of climate change, such as destruction of typical domestic landscapes and biosphere, spread of hazardous species, or economic problems due to water shortages in summer. A control group received a list of neutral national geographic facts. Afterward, as indicators of collective investment, they measured general authoritarian attitudes and the evaluation of various subgroups in society that either threatened (e.g., criminals) or supported (e.g., teachers) society. As predicted, across three samples, participants who had been reminded of climate change threat scored higher on general authoritarian aggression and derogated threatening societal groups more than control group participants. The notion that these effects indicate a general ethnocentric response is supported by recent additional findings showing that climate change threat salience also increased group-specific authoritarian responses in the context of the group of university students (e.g., derogating student subgroups who harm student interests; Barth, Masson, Fritsche, & Ziemer, 2017). These studies also found that students who had been reminded of climate change increased their support for radical left-wing actions if these actions were said to be appreciated by the majority of fellow students. Obviously, people respond to the threatening aspects of nature not just by illusions of purpose and predictability or by supporting existing systems of order. Moreover, nature threat may pave the way for people supporting their own groups and engaging in community-oriented actions. In accordance with this, Västfjäll, Peters, and Slovic (2014) report that people who were reminded of the 2004 South Asian Tsunami displayed more self-transcendent goals, such as spending for charities or investing in interpersonal relationships.

Attitudes Toward Nature and Wilderness

Although basic motives of self-preservation and control may elicit various defensive responses from compensatory or group-based control to biased perception of nature as purposeful and controlled by supernatural human allies, exposure to wild nature may, to some degree, constantly threaten people's cultural anxiety buffers. In fact, Koole and van den Berg (2005, Study 1) found that, when asked explicitly, Dutch participants associated stays in wild nature (vs cultivated nature or a city) with death-related thoughts. This mental link between nature and death should affect people's attitudes toward nature in general, especially in situations when they are motivated to fence-off existential threat. Indeed, two further studies by Koole and van den Berg (2005, Study 2) and Koole and van den Berg (2004) show that Dutch people judged noncultivated national landscapes as being more beautiful than cultivated landscapes, a preference that was reduced for those participants who had been previously reminded of death by working on a fear of death

questionnaire (vs no questionnaire; Koole & van den Berg, 2005) or answering an open-ended question about their own death (vs television; Koole & van den Berg, 2004).

Anthropocentric Versus Biocentric Concern

Terror management concerns of distancing from nature may not just result in reduced esthetic preferences for natural settings but may have serious consequences for how people respond to environmental crises. Given present-day over-utilization and destruction of the natural environment by humans (Rockström et al., 2009), people's attitudes toward pro-ecological action and policy changes seem crucial for whether sustaining modern civilization will be possible. However, when people experience high degrees of subjective and objective distance to their natural environment, their pro-environmental intentions are reduced (Collado, Corraliza, Staats, & Ruiz, 2014; Davis, Green, & Reed, 2009). Terror management processes that drive distancing from nature might thus prevent pro-environmental action.

As a basic process, terror management–induced devaluation of nature may reduce people's concern for the natural environment, which in turn will reduce their pro-environmental action intention. Fritsche and Häfner (2012) tested this proposed basic process in two studies. They distinguished between pro-environmental motivation with the aim to protect the natural environment for its own intrinsic value (biocentric motivation) and the motivation to protect the environment for the sake of humans (e.g., saving resources for future generations; anthropocentric motivation; Thompson & Barton, 1994). When mortality was salient, biocentric motivation went down, whereas for anthropocentric motivation, no effect appeared. In the second study, they further added a measure of environmental concern (Schultz, 2001). Here, people were asked why they are concerned about environmental problems, distinguishing between biospheric concern (because of the consequences for plants, whales, trees, marine life, birds, and animals), altruistic concern (consequences for humanity, children, general public, and future generations), and egoistic concern (consequences for me, my future, my lifestyle, my health, and my prosperity). In line with the assumption that terror management concerns reduce people's endorsement of nature's intrinsic value and thus their motivation to protect nature as an end in itself, mortality salience reduced biospheric concern for the environment, which mediated the negative mortality salience effect on biocentric motivation to protect the natural environment. For egoistic concern, as expected, no effect occurred. Unexpectedly, in this study, altruistic environmental concern was reduced under conditions of MS as well. Summed up, existentially motivated distancing from nature will at least change *why* people engage in pro-environmental action (i.e., sometimes for the welfare of humans, but not so much for the welfare of other natural beings). However, as other studies indicate that

biospheric motivation is the most reliable driver of pro-environmental intentions (Milfont, Duckitt, & Cameron, 2006; Schultz et al., 2005), it seems likely that terror management processes may substantially hamper people's willingness to protect the natural environment.

Nature as (Personal or Collective) Identity

It is bad news for saving the planet if humans' basic existential concerns lead to distancing from nature and reservations toward conserving the natural environment. Nevertheless, valuing and protecting the environment has become an important personal value for many people and a norm for many ideological groups, and even whole societies, around the globe. This is why things do not look as bad as they may seem on first glance. As we have lined out above, the need to buffer existential threats of mortality or control is binding people more strongly to their cultural standards of value. That is, if environmentalism is an important cultural norm, defending this norm and receiving personal value and control from acting pro-environmentally will help people to manage the existential inadequacies of the human condition.

Various studies have successfully tested the idea that whether terror management motivation increases or decreases pro-environmental intentions depends on internalized personal or salient cultural norms. Vess and Arndt (2008) opened up this line of research by measuring the degree to which people derive self-esteem from acting pro-environmentally. As predicted, salient mortality (vs pain) increased people's support for a pro-environmental policy decision for those participants who had indicated that their self-esteem is highly contingent on personal environmentalism. For those who indicated low self-esteem relevance of environmentalism, mortality salience decreased their pro-environmental concern. At the same time, environmental contingencies of self-worth predicted people's environmental concern only after mortality had been made salient but not in the control condition. This finding that existential concerns make people to act more in line with their personal environmental standards has been conceptually replicated in other studies. Nepomuceno and Laroche (2016) recently found mortality salience to moderate the positive effect of sustainable consumption attitudes on how much people were willing to resist unnecessary consumption. In a similar vein, Selimbegovic, Chatard, Er-Rafiy, and Pyszczynski (2016) found in three samples that participants who scored low on environmentalism responded to reminders of nuclear accidents or death (vs neutral topics) with more positive attitudes toward nuclear power. For people with higher environmentalism values, no effect of threat salience occurred.

Further supporting the interactive effects of mortality salience and personal environmental attitudes, the abovementioned results on biocentric environmental motivation by Fritsche and Häfner (2012) were moderated by personal environmental identity. The measure of environmental identity used

(Clayton, 2003) captured both the extent of personal contact to nature (e.g., "I spend a lot of time in natural settings [weeds, mountains, desert, lakes, ocean]") as well as people's self-definition as an environmentalist (e.g., "Being part of the ecosystem is an important part of who I am"). Mortality salience decreased biocentric motivation to protect the environment only for those people who identified lowly with the natural environment. No such effect occurred for high environmental identifiers, suggesting that in this study the terror management concerns of distancing from nature and defending cultural identities may have canceled each other out. Summing up, personal environmentalist values and personal identification with nature seem to protect people from potentially harmful effects of existential threat on pro-environmental action intention. Moreover, there are first indications that personal environmental values can even provide the ground for mortality salience increasing people's conservation attitudes. However, this hypothesis requires further testing. Initial results by Harrison and Mallett (2013) suggest that for people following more strongly a personal environmentalist agenda and following mortality salience it is necessary that they are reminded of these values in a situation of environmental decisions.

Whether ecologically minded people invest in pro-environmental decisions to buffer existential threat may strongly depend on the salient social-normative context. Conforming to and supporting cultural norms that are shared and validated within groups is a basic inclination people have under conditions of existential threat (Jonas & Fritsche, 2012; Jonas et al., 2008). Accordingly, as environmentalism belongs to the normative canon of most modern societies, if it is salient in a situation it should guide people's terror management responses toward increased pro-environmental action. Indeed, this is what a set of three studies by Fritsche, Jonas, Niesta Kayser, and Koranyi (2010) shows. An explicit manipulation of mortality salience led US participants to display more positive attitudes toward environmentally friendly consumption decisions and more interest in information on environmental topics when pro-environmental norms were made salient by an experimenter cleaning up a littered laboratory (vs an experimenter who littered). A second study challenged findings from previous research suggesting that people always become greedier following existential threat (Kasser & Sheldon, 2000). Instead, when norms of cooperation were made salient (by presenting respective information on Hardin's "tragedy of the commons"), mortality salience tended to increase participants' cooperation intention in a common resource dilemma game on forest management (i.e., restrained exploitation of the forest). In contrast, mortality salience increased competitive and nonsustainable decisions when a norm of self-interest (i.e., Adam Smith's "invisible hand" idea on market economy) was primed. Finally, a third study demonstrated the interactive effect of salient mortality and pro-environmental social norms on actual behavior. German university students participated in an experiment that was said to be about evaluating short

coffee advertisement videos produced by other students. As a compensation, participants were offered hot coffee or tea for takeaway either in a disposable or a reusable cup that would have to be returned later. People were either exposed to a video in which the student actor incidentally mentioned that having reusable cups is a good thing for the environment, whereas in the no-environmental norm salient condition she made a positive remark about the production of the video. This norm manipulation did not significantly affect participants' decision about either taking the disposable or the reusable cup when mortality was not salient, but it had a significant effect when people were subtly reminded of their mortality by a death-related (vs not death-related) poem written on a blackboard. When mortality and pro-environmental norms were both salient, a majority of 58% of the participants chose the reusable cup, whereas in the other conditions only the minority of 19%–31% of the participants did so. Obviously, collective norms of protecting the natural environment can override initial antigreen tendencies under conditions of existential threat. However, for doing so, environmentalist social norms have to be salient in a situation, as otherwise they may compete with plenty other norms that characterize modern industrialized societies and that often imply antienvironmental decisions (e.g., using a domestic flight instead of the train as it is faster and economically reasonable).

SUMMARY AND CONCLUSIONS

The human condition drives people to draw a line between their own, cultural, existence, and the natural world, fencing off mortality and uncontrollability, which is intimately associated with the principles of nature and that would otherwise cause them constant despair and paralysis. Departing from this basic terror management analysis of human–nature relations, a growing body of research supports the role of buffering existential threat for a deep-rooted ambivalence toward nature. This becomes obvious in the effects of mortality salience on the rejection of humans' animal nature (Goldenberg et al., 2001; Motyl et al. 2013; Vess et al., 2012) and biological aspects of the self (Cox, Goldenberg, Arndt, et al., 2007; Goldenberg et al., 2002) as well as the esthetic devaluation of wilderness settings (Koole & van den Berg, 2004, 2005) and reduced biocentric environmental motivation (Fritsche & Häfner, 2012). Obviously, distancing from nature is part of the human motivational setup as an animal that is struggling with the awareness of being mortal and existentially constrained. In fact, this attitude may have helped our ancestors to effectively, and sometimes recklessly, exploit natural resources.

However, nature has not just been an object of exploitation. At the same time, it has become an object of care and identity. In other words, after mentally splitting off nature from the supernatural, human world, it seems as if humans re-imported nature as an object of cultural value. This is why, from

the perspective of existential psychology, humans' relationship with nature is not just negative or exploitative but ambivalent. For nature being valued under conditions of existential threat, its cultural and personal significance needs to be brought to the fore. This is illustrated in the studies discussed earlier showing that people increase (or at least do not decrease) their pro-environmental attitudes and behavior following mortality salience if they identify with the natural environment (Fritsche & Häfner, 2012), are personally invested in environmentalism (Harrison & Mallett, 2013; Nepomuceno & Laroche, 2016; Selimbegovic et al., 2016; Vess & Arndt, 2008), or are reminded of pro-environmental cultural norms (Fritsche et al., 2010). Obviously, there is a way that humans reconcile their existential concern to distance from nature with the fact that they are highly dependent on the natural environment and its resources to sustain their very existence. The more people adopt environmental identity and pro-environmental attitudes as a cultural standard of value, the less will their unconscious existential motives drive them toward global environmental doom. Perhaps, existential threat may even foster pro-environmental awareness and action when people assign cultural value to preserving nature.

From an applied perspective, these considerations imply that common-sense ideas about existential societal crises (e.g., natural disasters or war) to lower people's interest in "luxury" topics such as environmental protection may be wrong. Instead, those times may often be the origin of societal reform and fighting for collective, culturally valued projects and ideals (Jonas & Fritsche, 2012). This is reflected in the effects of natural disaster or climate change threat on the endorsement of self-transcendent values (Västfjäll et al., 2014) and the defense and enactment of collective norms and standards (Barth et al., 2017; Fritsche et al., 2012). That is, societies who highly value the natural environment and for whom this value is in public focus may experience a surge of environmentalism in times of crisis.

Beyond nature's intrinsic association with death, it also has the potential to threaten certainty and control, which people respond to by illusory perceptions of nature as predictable (Rutjens et al., 2010) and purposeful (Stephens et al., 2013) and by supporting systems of order (Kastenmüller et al., 2013) and investing in agentic in-groups and communities (Barth et al., 2017; Fritsche et al., 2012; Västfjäll et al., 2014). It is not clear yet, whether the effects of people's concern to tackle with mortality on human–nature relations are independent of those that are motivated by maintenance of control (Fritsche et al., 2008) and certainty (Hohman & Hogg, 2015). From the angle of existential philosophy, the human tragedy is rooted in humans' awareness and construction of their self as an infinite and omnipotent entity that they can project in time and space, which conflicts with both their awareness of mortality and the tight boundaries of human control. However, although the motives of self-preservation and control might both be considered "existential," different aspects of nature may threaten different existential motives as

nature may be associated with both mortality and threatened control. Alternatively, only one of the two mentioned motives might be sufficient to explain humans' ambivalent relationship with nature. For instance, as death might be the most impressive and distinct reminder of fundamental restrictions to human control, mortality salience effects on ambiguity toward nature may reflect humans' concern for maintaining control rather than preserving the self (Fritsche et al., 2008). At the same time, nature's unpredictability and control depriving quality might work as an indirect reminder of mortality, which may explain why people respond defensively to reminders of natural disasters. Future research may solve the riddle.

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Chapter 7

The Curse and the Blessing: The Self as Source of the Terror and the Primary Avenue for Managing It

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> *What does it mean to be a self-conscious animal? ... It means to know that one is food for worms. This is the terror: to have emerged from nothing, to have a name, consciousness of self ...*
>
> Becker (1973, p. 87)

All animals are predisposed to continue surviving and avoid death—and experience alertness, arousal, and fear when that survival is threatened. As humans, we are not just aware of and vigilant toward our external world, but also toward ourselves. Self-awareness has probably been of great adaptive value for humans, as it helps us consider our past experiences and future possibilities, and regulate our behavior toward desired goals. However, this awareness of self—that you are a being existing in the world—is also a prerequisite for realizing that you could not exist and, indeed, may no longer exist upon inevitable death. We can think about this core desire to continue existing as being threatened at any given time, and being ultimately thwarted sooner or later, in one way or another. In other words, self-consciousness leads to the conclusion that this conscious being—the self—will one day be no more. This is the source of the terror that we spend our whole lives managing in various ways.

Terror management theory (TMT) is thus, in essence, a theory about the self and how we manage the terror of being self-conscious, which comes with the inevitable realization of our mortal nature. As Rank (1936/1978) noted, self-consciousness led to the problem of awareness of mortality in the first place, but it has also provided the cognitive bases for subsequently

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managing that problem and minimizing the terror that this realization can engender. Specifically, we humans seek to establish and sustain a coherent sense of a valuable self-identity that will continue beyond physical death; this is the primary vehicle for managing this potential terror of death.

Because the self is so central to TMT, we cannot possibly cover all facets of its role and the research pertinent to it in one chapter. Indeed, we would argue that every chapter in this handbook addresses certain aspects of the role of the self in terror management. So in this chapter, we will try to focus on some central ways in which the self is the source of both the problem and solution of terror management. We will begin with delving into the nature of self and self-esteem, how they emerge and come to serve terror management, guided largely by Becker's (1971) *The Birth and Death of Meaning*. Then we will review the TMT literature as it pertains to the roles of self-esteem, a coherent sense of self, self-awareness, and self-expansion in terror management. Finally, we will point to some remaining questions and directions for further research.

THE EMERGENCE OF THE NEED FOR SELF-ESTEEM

So how do we protect ourselves from the idea that one day we will no longer exist? As has been established in prior chapters, a central proposition of TMT is that a key defense against death anxiety is secure self-esteem. Indeed, we believe TMT provides the most compelling understanding of what self-esteem is and why people need it. Self-esteem develops from infancy, and acts as an anxiety-buffer even before a child is able to fully understand death abstractly (for an extensive account, see Solomon, Greenberg, & Pyszczynski, 2015). Becker and Rank (along with Freud, Mead, Erikson, Bowlby, and many other psychoanalytic and developmental psychologists) recognized that when we are very young, we do not see ourselves as an independent being, for we do not yet fully distinguish ourselves from our parents, especially our mother (e.g., Becker, 1971, 1973; Mead, 1934; Rank, 1932). Mead (1934, p. 135) stated, "The self is something which has a development; it is not initially there, at birth, but arises in the process of social experience and activity, that is, develops in the given individual as a result of his relations to that process as a whole and to other individuals within that process."

Thus initially, we do not quite understand that we have our own agency, and in a way, we do not, for we are almost completely dependent. Indeed, at some rudimentary level, we realize our helpless dependence, as all our needs can only be met through our caretakers. Feelings of coldness, hunger pangs, pain, are all alleviated only by our wondrous parents. We feel safe in the arms of our parents, which helps us feel like nothing bad can ever happen to us, let alone death. They quell our distress and inchoate fears. Becker (1973, p. 22)

notes, "The child who is well nourished and loved develops ... a sense of magical omnipotence, a sense of his own indestructibility"

As we become toddlers, we adopt external perspectives on ourselves and develop a sense of our own awareness in the world. We also begin developing an ego that allows us to pull out of monitoring ongoing sensations, and allows us to consider the past and the future (Erikson, 1959). Our profound helplessness combined with our growing self-awareness and capacity to think of future possibilities produces a creature uniquely prone to fear and anxiety. Complicating matters further, as we become more effective in asserting our own desires, the seemingly omnipotent parents begin putting conditions on their approval and having negative responses when we do not meet those conditions. Our developing ego learns to negotiate between our core *id* desires and what the parents and the world need us to do to satisfy those desires.

To sustain our parent's love and protection, a preliminary superego (or generalized other in Mead's terms) begins to develop as we start internalizing their rules and values, so we can continue to feel safe and secure. Because parents are the primary security base, parental disapproval and anger are the existential equivalents of being abandoned in a dangerous world, or even being thrown into an abyss. Disapproval does not just make the child feel as if they have done something wrong, but is actually anxiety provoking in an existential sense. So "good" versus "bad" becomes internalized and conditioned to be the equivalent of "safety" versus "threat." And being good often requires stifling one's authentic desires and controlling one's animal urges. So, in this sense, the socialization process involves transforming from being an impulsive physical creature to a being a self-regulated symbolic self. And thus begins the (symbolically) eternal quest for self-esteem (Greenberg, 2008; Solomon, Greenberg, & Pyszczynski, 1991).

Over childhood, as we develop cognitively, we become more and more aware of external threats in the world, and fears and nightmares about that which might harm and kill us emerge—big dogs, ghosts, monsters, bad people, and so forth. As Becker (1971) notes, we adults have all forgotten how vulnerable we were as kids, with adults all around us who could crush us easily. In addition, we become more and more aware that our parents are fallible and vulnerable themselves, and can only protect us up to a point. Consequently, there is a shift over childhood from deriving safety and security from the love of the parents to deriving it from the love and protection of more powerful entities such as deities, authority figures, the nation, and culturally valued ideas and causes.

Thus one's basis of self-esteem shifts from the parents' values of good and bad to those of the larger culture. This is generally a smooth transition because the parents largely convey the present culture's worldview and values to the child from infancy. Self-esteem is thus "a natural systemic continuation of the early ego efforts to handle anxiety; it is the durational

extension of an effective anxiety-buffer" (Becker, 1971, p. 67). Self-worth ultimately becomes a basis not just of parental approval, but of entry into "heaven" (or another conceptualized eternity) in addition to a valued, permanent place on earth in the ongoing national, religious, artistic, and scientific collectives that are central to an individual's culturally derived worldview. People can feel transcendent of death over the life span as they achieve forms of literal and/or symbolic immortality through their attributes and contributions that are valued by the culture to which they subscribe.

In this way, self-esteem becomes the feeling that one is "an object of primary value in a world of meaningful action" (Becker, 1971, p. 79). This adherence need not be uniform; it can take a variety of forms that may change from person to person, as long as the individual believes what he or she is adhering to is part of something larger that has lasting value, thus providing the self-esteem that acts as an existential buffer. This concept is similar to how James (1890) first described self-esteem: one's success divided by one's pretensions for said success. "Pretensions" correspond to what matters to a particular individual. Thus, in order to glean self-esteem from something, we have to assign importance to it. And, according to Becker, what is given importance varies depending on one's culture, which contains multiple domains from which one can draw self-esteem. James (1890, p. 291) said that the self is composed of three dimensions: material, social, and spiritual. He says, "In its widest possible sense however, a man's Self is the sum total of all that he CAN call his, not only his body and his psychic powers, but his clothes and his house, his wife and children, his ancestors and friends, his reputation and works…." The self is inextricably linked with a number of other concepts such as society and material objects, and is not simply about a person, but everything that is related to it. Kierkegaard (1843/1955), although coming from a religious framework, got at this same concept in writing about having a defining relationship with a greater force (in this case, God) being necessary to the self in order to avoid anxiety and despair.

Becker (1971) provided a somewhat different typology of sources of self-worth than James. He argued that people derive self-worth from four sources of increasing power and meaning: the personal, a sense of one's inner true self and one's gift; the social, one's connection to family and friends; the secular, one's larger identifications, "the corporation, the party, the nation, science, history, humanity" (Becker, 1971, p. 186); and the sacred, personalized connections to nature and God. Consistent with Kierkegaard, Becker argued that this fourth and highest level provides the best form of self-esteem, cosmic heroism. He maintains that this level defies disconfirmation, and serves the highest power, and thus can allow people to approach true self-reliance, and be least dependent on other *people* to determine their sense of significance. They have attached their self-concept to something greater, something cosmic that transcends their earthly selves.

However, there is no way to fully throw off the shackles of our cultural upbringing that determine how we strive for self-esteem. Each of us is a product of a childhood struggle to control our anxieties that leads us toward the culturally shared neuroses, particular ways of fragmenting our perceptions, limiting our experiences and behavior, and giving over control of ourselves to higher powers. Becker (1971, p. 142) summarizes it this way:

> *. . . the person's character is built on a denial of anxiety, loss of support, and obliteration. This anxiety stems from the child's smallness, helplessness, felt finitude. He simply does not want to be obliterated and abandoned or remain small and helpless. The symbolic self becomes his means of changing his situation from weakness to strength, and his character develops as a vehicle for this. . ..What we call character is really a series of techniques or a style of living, aimed principally at two things: to secure one's material survival; and to deny the fact that one really* has no control *over his finitude: mutilation, accident, and death lurk at every breath, and this is what one tries to forget.*

Anticipating Deci and Ryan's (2003) self-determination theory and research, Becker (1971) argued that the most effective self emerges when the child is allowed to feel as supported, competent, and autonomous as possible, so that he or she has truly integrated the internalized cultural values into the self. In this way, the individual truly wants to strive to live up to those cultural thoughts and ideals without feeling bound down or overwhelmed by them. Such people will have durable bases of self-worth, a sense of their own authentic desires, self-reliance (or autonomy), a lack of defensiveness, and the resources and flexibility to sustain their self-esteem no matter what challenges life throws at them.

SELF-ESTEEM, THE ANXIETY-BUFFER

> *I have seen the moment of my greatness flicker,*
> *And I have seen the eternal Footman hold my coat, and snicker,*
> *And in short, I was afraid.*
>
> T.S. Eliot (1915)

Becker's ideas of cultural self-esteem as an anxiety-buffer and the core basis of protection from awareness of our vulnerability and mortality have been incorporated into TMT and supported in a variety of ways by many studies (Greenberg, 2008; Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). Even before TMT was introduced into empirical psychology, high self-esteem had been long known to be associated with well-being, and low levels of self-esteem with anxiety and other physical and emotional problems (Beck, 1967; Orth, Robins, & Roberts, 2008; Rosenberg, 1962; Solomon et al., 1991). In addition, Orth and Robins (2014) have recently

reported longitudinal research which found that self-esteem predicts success and well-being much later in life in domains of work, health, and relationships.

TMT-based research has complemented this correlational evidence with experimental evidence that strongly supports not only that self-esteem is an anxiety-buffer, but that it is a central basis for managing concerns about mortality. The literature has accomplished this by boosting or threatening self-esteem experimentally, by assessing how reminders of mortality affect self-esteem striving, and by assessing the effect of self-esteem threat on death-thought accessibility (DTA).

In the very first TMT study to assess the anxiety-buffering function of self-esteem, Greenberg et al. (1992) gave participants either extremely positive or mildly positive false personality–test feedback, and then watched either a video with scenes of death, or a neutral video. For those who had received only mildly positive personality feedback, self-reported anxiety was much higher after the death video than the neutral video. However, there was no difference in anxiety between the two videos when the participants had received extremely positive feedback. In other words, after self-esteem was boosted, it effectively acted as an anxiety-buffer. In two follow-up studies, skin conductance was used as the measure of anxiety, and in both occasions, boosting self-esteem (via personality feedback or test-performance feedback) eliminated the increase in skin conductance otherwise found when participants were expecting the possibility of receiving electric shocks. Thus, these three studies demonstrated that boosting self-esteem reduces anxiety overall, and perhaps especially anxiety related to death.

In a subsequent study by Greenberg et al. (1993), participants who received mildly positive personality feedback and who had been told that emotionality was associated with a shorter life expectancy, were more likely to self-report less emotionality, in an effort to deny vulnerability to an early death, and vice versa (more likely to self-report higher emotionality if told that it was associated with a longer life expectancy). However, after self-esteem boost in the form of highly positive personality–test feedback, participants did not show this bias in their self-report. In a follow-up study, the researchers replicated this finding, but this time using trait self-esteem instead of manipulated self-esteem, and as before, those with high self-esteem did not distort levels of emotionality to match with what they had been told leads to a longer life expectancy. These results provide converging evidence that self-esteem acts as an anxiety-buffer against perceived vulnerability to death at both the trait and state level.

More recently, Routledge (2012) showed that threatening self-esteem increased self-reported death anxiety. Complementing this research, Routledge et al. (2010) experimentally showed that making mortality salient can increase anxiety and undermine well-being, but that self-esteem can avert these negative consequences. Routledge et al. measured multiple

qualities often associated with well-being (satisfaction with life, subjective vitality, meaning in life, positive and negative affect, exploration, state anxiety, and social avoidance). They found that thoughts of death (both measured and induced) decreased satisfaction with life, subjective vitality, and meaning in life, while increasing negative affect, state anxiety, and social avoidance. Importantly though, these effects were only found for those low in self-esteem (both measured and manipulated). In addition, effects were only found when thoughts of death were outside of attention, providing further evidence for the dual defense model of TMT (see Chapter 2, this volume; also see Juhl & Routledge, 2016 for a summary).

Research has also found that boosted self-esteem attenuates the normal delayed increase in DTA that occurs after mortality salience (MS) inductions (e.g., Harmon-Jones et al., 1997). And conversely, threatening someone's self-esteem, challenging their worldview, and reminding them of their animality all have been found to increase DTA (e.g., Hayes, Schimel, Faucher, & Williams, 2008; Hayes, Schimel, Arndt, & Faucher, 2010).

SELF-ESTEEM AND MORTALITY SALIENCE–INDUCED WORLDVIEW DEFENSE

Self-esteem has also been shown to mitigate worldview defense in response to MS (for reviews of the MS hypothesis and worldview defense studies, see Burke, Martens, & Faucher, 2010; Solomon, Greenberg, & Pyszczynski, 2004). In one of the most widely cited studies on this effect, Harmon-Jones et al. (1997) conducted three studies illustrating that high self-esteem (boosted in Study 1, measured in Studies 2 and 3) attenuated otherwise defensive reactions after MS (preference for a pro-US essay). Consistent with these findings, Schmeichel and Martens (2005) showed that an opportunity to self-affirm, which may bolster self-esteem or one's basic values from which self-esteem is derived, also reduces defensive reactions to MS. These findings converge on the idea that self-esteem mitigates the anxiety and defensiveness otherwise engendered by reminders of death. However, if after a self-esteem boost, mortality is made salient, and then the worldview basis of that self-esteem boost is threatened, a defensive response is not mitigated (Arndt & Greenberg, 1999).

Although high dispositional self-esteem has been shown to mitigate defensive reactions after reminders of death (e.g., Greenberg et al., 1993; Harmon-Jones et al., 1997), it has been occasionally found to have the opposite effect, actually increasing worldview defense in certain situations (Baldwin & Wesley, 1996; Landau & Greenberg, 2006; McGregor, Gailliot, Vasquez, & Nash, 2007). To clarify, there is no controversy as to whether high self-esteem acts as a buffer against anxiety in general, and that viewing oneself positively leads to higher levels of well-being, as previously discussed (Blascovich & Tomaka, 1991; Orth & Robins, 2014;

Rosenberg, 1962; Routledge et al., 2010). Nor is there disagreement that *manipulated* self-esteem mitigates worldview defense (see Pyszczynski et al., 2004). In this case the controversy lies in how *trait* self-esteem *interacts* with MS, and whether it leads to increased or decreased defensive reactions. This complexity probably exists because there are different facets of trait self-esteem, and the ways in which it manifests can vary.

In some cases, high self-esteem interacts with MS in a more nuanced way. For example Landau and Greenberg (2006) showed that after MS, participants low in self-esteem were less motivated to take risks than were participants high in self-esteem. Following Steele, Spencer, and Lynch (1993) Resource Model, the authors argued that this is most likely because those low in self-esteem have more at stake when taking a risk, whereas those high in self-esteem have more resources to draw upon to compensate for any potential loss to one aspect of self-esteem. Having less resources at one's disposal, one would be more likely to take a low risk, low reward path, whereas those who have many resources might as well take the risk for a higher reward, since even if they fail they have other ways to compensate.

Schmeichel et al. (2009) attempted to clarify the mixed findings regarding high and low trait self-esteem as it relates to worldview defense after MS by measuring implicit and explicit self-esteem. Explicit self-esteem reflects one's own evaluations of him or herself; i.e., conscious evaluations, whereas implicit self-esteem refers to a more unconscious, inaccessible gut-level reaction to one's own self-worth. Note that the two (implicit and explicit self-esteem) do not always line up (Zeigler-Hill, 2006). In Schmeichel et al.'s (2009) first study, they measured dispositional implicit self-esteem using a name letter–ratings implicit association test (IAT), and found that participants high in implicit self-esteem were less defensive of their worldview after MS than those with low implicit self-esteem (measured by reactions to an essay written by a foreigner).

The second study manipulated implicit self-esteem by using subliminal primes so that participants would associate positive attributes with themselves, thus boosting their implicit self-esteem. Again, attenuated worldview defense was also observed for those who had been given a boost in implicit self-esteem. The last study in the set measured implicit and explicit self-esteem (using an IAT and the Rosenberg scale, respectively), and found that participants low in implicit self-esteem but high in explicit self-esteem responded most defensively after MS (they were more likely to attribute positive personality traits to themselves to buffer against the anxiety incurred by MS). This fits the characterization of such people as having unstable or insecure self-esteem, or possibly even narcissism (Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003).

Juhl and Routledge (2014) provided further evidence that high *trait* self-esteem (high explicit self-esteem) leads to increased worldview defense (measured by willingness to die for one's country and negative reactions to

an essay that challenged one's worldview). Being that individuals with high trait self-esteem are more invested in their worldviews (self-esteem is gleaned from adherence to worldviews, thus high self-esteem indicates a stricter adherence), it follows that those with high self-esteem would be more motivated to defend the said views and thus keep their anxiety buffers strong. This is consistent with previous literature showing that high self-esteem by itself is associated with a greater desire to defend one's sources of worth (Baumeister, Smart, & Boden, 1996). Thus, it makes sense that the MS effect may be even more pronounced in high trait self-esteem people when they are given the opportunity to defend their worldview. For those with low trait self-esteem, on the other hand, Juhl and Routledge (2014) showed that these individuals scored highest on a subscale of the Search for Meaning in Life scale (Steger, Frazier, Oishi, & Kaler, 2006) after an MS prime. Individuals low in trait self-esteem see life as less meaningful after MS (Routledge et al., 2010), thus instead of turning to and defending worldviews to maintain a sense of meaning (for which they may lack sufficient resources), they respond to MS with an increased search for meaning.

The differences found with regard to self-esteem in previous studies highlight that the type of self-esteem and the context in which it is drawn from may affect what outcome it has. Schmeichel et al. (2009) showed that high explicit self-esteem may lead to increased defensive reactions and esteem striving when accompanied by low implicit self-esteem. However, in other scenarios, studies have found low or average explicit self-esteem to be associated with more worldview defense after MS (Gailliot, Schmeichel, & Maner, 2007; Goldenberg & Shackelford, 2005; Harmon-Jones et al., 1997). Schmeichel et al. (2009) note that there are a variety of potential reasons for these conflicting results such as the stability of someone's self-esteem (e.g., Harmon-Jones et al., 1997 measured self-esteem over a longer period of time and thus had a more stable measure), what type of self-esteem was measured and how (e.g., implicit vs explicit), whether the dependent variable being measured is equally valued to all participants (e.g., Goldenberg & Shackelford, 2005), and even levels of self-control that may be lower in low-esteem individuals (Gailliot, Schmeichel, & Baumeister, 2006; Gailliot et al., 2007).

For example, Goldenberg and Shackelford (2005) found that participants who had low explicit self- and body-esteem were more likely to distance themselves from the body after MS (thereby dissociating from their "animal" and mortal nature), whereas those high in explicit self-esteem did not feel the need to do this. The authors argued that this was probably because for participants with high body- and self-esteem, the body is not a source of existential anxiety (and if anything it is the opposite, for their body-image *contributes* to their self-esteem) and so a generic MS prime did not result in any sort of body-distancing. Thus, this study illustrates that high explicit self-esteem does not predict defensive reactions to MS if individuals are secure in the domain being assessed.

However, as previously noted, in Arndt and Greenberg (1999), if the self-esteem source that would be relevant to preventing a defensive reaction is threatened, then high self-esteem cannot be relied upon to prevent a defensive reaction, because the source of that high self-esteem is being directly attacked. In this case, for example, it is possible that if participants were given negative feedback about their own bodies after MS, even those with normally high body-esteem may respond with a distancing from the body in order to dissociate themselves from the negative feedback.

Being that self-esteem is gleaned from worldviews, things that bolster one's worldview and serve a self-esteem function can thereby mitigate worldview defense as well. Taking religiousness as an example, Jonas and Fischer (2006) showed that those high in intrinsic religiousness did not respond defensively if they had been given prior opportunity to affirm their religious beliefs. In addition, for those with high intrinsic religiousness, affirming religious beliefs led to an attenuation of DTA after MS. Likewise, Norenzayan and Hansen (2006) showed that MS increased participants' self-reported religiosity and belief in deities (see Vail et al., 2010; Flanelly, 2017; for reviews on religion's role as an anxiety-buffer). Religiousness is just one of many examples of how a boost to one's worldview indirectly mitigates defensiveness by increasing self-esteem.

In sum, self-esteem unquestionably serves as an anxiety-buffer, but as seen previously, "not all forms of self-esteem are equal in this respect" (Schmeichel et al., 2009, p. 1083). The differing results regarding self-esteem and worldview defense are by no means mutually exclusive. Rather, the varied results highlight the fact that different facets of self-esteem will interact differently with MS depending on the context. When measuring trait self-esteem, it is always important to keep in mind which aspect of self-esteem is being measured (e.g., implicit, explicit), and in addition to be aware that the measure of defensiveness can be differentially relevant to those with high versus low self-esteem. That is, the dynamics of how self-esteem manages terror are not always the same.

CULTURAL SELF-CONSTRUALS AND IN-GROUP IDENTIFICATION

Although there is plenty of evidence regarding the effects of MS and moderators on worldview defense and favoring one's own group over rival groups, Routledge, Juhl, Vess, Cathey, and Liao (2013) wanted to explore how self-construals can moderate the way MS affects identification with social groups. As TMT claims, we turn to the culture at large for a sense of meaning and self-esteem in response to reminders of mortality. Routledge et al. (2013) designed a study aimed to explore whether increased in-group identification after MS is more characteristic of people with high interdependent self-construal (defining oneself vis-à-vis others). Indeed, Chinese

participants (who are considered to be a part of a relatively interdependent culture) showed increased nationalism after MS, whereas American participants did not. In Study 2, MS increased favoring of one's university only for students with high interdependent self-construal. In a third study, self-construal among religious participants was manipulated. Those who had been primed to adopt an interdependent self-construal (by being asked to write about what makes them similar to friends and family) subsequently reported increased willingness to self-sacrifice for their religion compared to those primed with an independent self-construal (who had been asked to write about what makes them different from family and friends).

This and similar findings (e.g., Juhl & Routledge, 2014; Pyszczynski, et al., 2006) suggest that, although like animals, we are normally biologically predisposed toward avoid death at all costs, sometimes our investments in literal and symbolic immortality can be even more important than personal physical survival. In light of prior evidence of MS increasing worldview defense in Americans and other samples likely high in independent self-construal, these combined findings suggest that defending and sustaining one's level of faith in one's worldview may be a universal response to MS. But, going further and *increasing* identification or investment in one's in-groups may be limited to those whose self is especially intertwined with those in-group identifications.

MORTALITY SALIENCE AND STRIVING FOR SELF-ESTEEM

Whereas the studies reviewed so far have shown that boosting self-esteem mitigates anxiety and defensive behaviors after MS, other studies have tested the complementary hypothesis that after MS, efforts to bolster self-esteem increase (just as efforts to bolster one's worldview do). This of course follows from the idea that when death-thought accessibility (DTA) is heightened, people become motivated to strengthen their bases of terror management. Ben-Ari, Florian, and Mikulincer (1999) conducted the first set of studies supporting this hypothesis. They found that Israeli soldiers who reported deriving self-esteem partly from their driving ability responded to MS by advocating taking more risks driving and by driving more boldly on a driving-simulator. They also found that if such participants were first self-affirmed (and hence had boosted self-esteem), they no longer exhibited a need to drive more boldly.

Subsequent studies extended these findings to a variety of other bases of self-esteem. MS led scuba divers to report they would take more risks underwater (Miller & Taubman–Ben-Ari, 2004). Males after MS generally report more interest in "macho" risk-taking activities (Hirschberger, Florian, Mikulincer, Goldenberg, & Pyszczynski, 2002). Peters, Greenberg, Williams, and Schneider (2005) demonstrated that after MS people whose self-worth was derived partly from physical strength increased the strength of their grip

on a hand dynamometer. Jonas, Schimel, Greenberg, and Pyszczynski (2002) showed that MS increases generosity toward valued charities. MS also increases preference for self-esteem conferring luxury items and material goods (e.g., Arndt, Solomon, Kasser, & Sheldon, 2004; Heine, Harihara, & Niiya, 2002; Mandel & Heine, 1999; Mandel & Smeesters, 2008). McCabe, Carpenter, and Arndt (2015, 2016) have shown that MS motivates heroic actions and identifications, which in turn reduce DTA. Arndt, Greenberg, Schimel, Pyszczynski, and Solomon (2002) demonstrated that MS leads to dis-identification with one's own in-group when identifying with the in-group could damage the individual's self-esteem. Zestcott, Lifshin, Helm, and Greenberg (2016) showed in two studies that for people invested in their basketball skills, MS improved performance in basketball. Recently, MS has even been shown to lead to an increased desire to work (Yaakobi, 2015), and an increased motivation and satisfaction with one's university, for participants who strongly identify with their university (Salgado, Pues, & de Calvo, 2015), suggesting that the workplace acts as a strong source of self-esteem.

Goldenberg, Arndt, Hart, and Brown (2005) extended these findings to the domain of food consumption. They showed that American women but not men ate less after an MS prime. Given that the cultural standard in the United States (as well as in many other westernized cultures) is a thin ideal for women, women derive self-esteem from living up to this standard. Thus, women in the MS condition were motivated to regain this cultural ideal (being conscious of food intake and eating less), and thus regain self-esteem.

MS has been shown to affect a variety of other health-relevant intentions and behaviors as well, in both harmful and constructive ways. In sum, unless people are consciously thinking about death (in which case they usually will make healthy choices), health decisions are often made based on the choice that best supports their sense of value within the culture (Arndt & Goldenberg, 2017). On the negative side, MS leads people to seek a better tan, unless they are led to believe a pale look is preferred to a tan look (e.g., Cox et al., 2009). MS also leads smokers who base their self-worth partly on their smoker identity to increase their intentions to smoke (e.g., Arndt et al., 2013). In addition, MS leads people to make lifestyle choices endorsed by celebrities rather than healthcare experts (McCabe, Vail, Arndt, & Goldenberg, 2014). This most likely occurs because MS increases the desire to feel connected to culturally valued people, and thus bask in their reflected glory. On the positive side, MS leads people who base self-worth on fitness to increase their intentions to exercise. And when breast self-exams (BSEs) are framed as empowering (compared to practical instructions), heightened DTA led women to increase their intentions to conduct BSEs (e.g., Goldenberg, Arndt, Hart, & Routledge, 2008; for reviews, see Greenberg, Vail, & Pyszczynski, 2014 and Chapter 10, this volume).

In addition to these impressive demonstrations on the effects of MS on preferences, intentions, and behaviors, studies have shown that MS increases

a variety of self-esteem serving cognitive biases. For example, participants who saw death-related stimuli rated themselves as having more positive than negative characteristics (Paulhus & Levitt, 1987). Mikulincer and Florian (2002) found after MS, participants were more likely to attribute their failures on a task to an external source of control, and that this also decreased DTA. And as described earlier, Landau and Greenberg (2006) showed that those with high self-esteem are more willing to take risks after MS, following a "high risk, high reward" philosophy, and vice versa.

From the TMT perspective, self-esteem striving is the route to symbolic immortality, the feeling that some aspect of oneself will continue on after one's physical death. A number of findings are consistent with this idea. Greenberg, Kosloff, Solomon, Cohen, and Landau (2010) showed that MS increases the desire to be famous, to have a star named after oneself, and to like abstract art better if it was attributed to a celebrity. Based on this link of self-esteem to symbolic immortality, Dechesne et al. (2003) reasoned that if people were convinced they would have literal immortality—with their consciousness continuing on past death—they would have less need to pursue symbolic immortality through self-esteem bolstering. Supporting this hypothesis, they found that if MS participants were given (fabricated) scientific evidence for consciousness after death, they did not inflate their self-report of the extent to which they had positive personality characteristics, whereas participants lacking such evidence did inflate such beliefs after MS. Finally, further supporting a link between self-esteem and symbolic immortality, a recent survey showed that people higher in self-esteem are more convinced that they will be remembered after their death (Lifshin, Helm, & Greenberg, 2017),

MS activating self-esteem striving has also been shown in the context of close relationships, including parent-child. MS has been shown to increase one's desire for offspring (Fritsche et al., 2007), except if women believe that having children will interfere with their career success (Wisman & Goldenberg, 2005). MS also increases the desire to name future offspring after oneself (Vicary, 2011) and Hoppe, Fritsche, and Koranyi (in press) have shown that these effects reflect a desire for extending some aspect of the self into the future. In addition, Yaakobi, Mikulincer, and Shaver (2014) showed across six studies that the prospect of future parenthood serves a terror management function, especially for people low in avoidant attachment. For such individuals, MS increased thinking about being a parent. In addition, thinking about being a parent reduced DTA and thinking about obstacles to parenthood increased DTA. In a final study, similar to the Wisman and Goldenberg finding, MS led even avoidant people to think more about parenthood if they were convinced that parenthood was compatible with their core career strivings.

People also gain self-esteem and affirmation from their romantic relationships. Romantic partners serve a terror management function because, by

caring about us and expressing their love for us, they bolster our sense of self-worth. Cox and Arndt (2012) conducted a series of studies testing this idea. They showed that MS primes (compared to control primes) lead people to overestimate how positively their romantic partners (and their parents) see them, and that this effect occurs mainly among individuals who report that their sense of self-esteem is highly contingent on their relationships. Furthermore, among people who are in a romantic relationship, MS increased commitment and investment in the romantic relationship, and this effect was mediated by the level of perceived positive regard from the romantic partner. The more that people think that their partners think highly of them after MS, the more that they want to invest in the relationship (and this is especially the case for people high in relationship-contingent self-esteem). In another study, participants who imagined a time when their romantic partner held a positive view of them (vs a negative one) showed lower levels of DTA after MS primes, showing that positive regards from a romantic partner serve an anxiety-buffering function.

Similarly, Kosloff, Greenberg, Sullivan, and Weise (2010) provided evidence that in the context of short-term relationships, MS increased attraction to partners possessing "trophy"-like characteristics that may increase their own self-esteem. Interestingly, in the context of long-term relationships, MS increased attraction to people who share similar worldviews (and thus may be a source of worldview affirmation). Supporting the notion that self-esteem enhancement plays a central role in the short-term partner appeal of trophy-like partners after MS, the researchers showed that compared to two control conditions (a loneliness prime and a neutral prime), MS increased the cognitive accessibility of self-esteem relevant constructs and preference for self-esteem bolstering features in the partner, in the context of short-term dating (and increased the accessibility of worldview-relevant constructs and preferences for worldview-affirming features in long-term dating contexts). In a related study, Strachman and Schimel (2006) found that MS reduced feelings of commitment to romantic partners if participants were asked to think about worldview differences between themselves and their partner. Thus, it seems like one of the core terror management functions of close relationship is to provide people with a buffering source of self-esteem, as well as to affirm their cultural worldviews.

We should note one complexity regarding the relationship between MS and increased self-esteem striving, which is people have multiple routes of striving for self-worth. The existing evidence suggests that the particular kind of self-esteem bolstering behavior a person chooses will be based on whichever of their values or norms are salient at the time. Supporting this point, Jonas et al. (2008) found that the norm that was salient at a given time (i.e., which cultural norm/value was being presented to the participants) predicted how participants would respond after MS. Specifically, participants were equally likely to conform to two opposing norms, depending on which

had been made salient prior to MS. For example, priming helpfulness increased people's helpfulness after MS, whereas priming conservatism led to harsher reactions against a moral transgressor. In other words, reactions to MS were guided by whichever norm had been activated. This research provides nice external validity, because outside of the controlled space of the laboratory, there are a multitude of cultural values that can be followed to bolster self-worth for any given member of society, and which is chosen will depend in part on what values are most salient/accessible for a particular situation.

I AM A PERSON, NOT AN ANIMAL!

The fundamental belief upon which every individual's terror management is predicated is that he or she is more than just an animal. Our cultures teach us that we humans have a soul and/or a symbolic identity that endures beyond physical death. Self-esteem, the view that we have some enduring value, builds on this view of our superiority to animals. Thus, MS should motivate people to be especially likely to deny their animality despite their bodies and creaturely activities. In addition, reminders of our creatureliness should increase DTA. A substantial empirical literature spearheaded by Jamie Goldenberg et al. (see Goldenberg, 2012; or Chapter 10, this volume) has supported these hypotheses. Indeed, they have found that MS leads to more rejection of an essay emphasizing similarities between humans and animals, of physical aspects of sex, of bodily products, of physical sensations, sexual women, and women who are breastfeeding. In addition, DTA is elevated when people are thinking about the physical aspects of sex and of bodily products. These tendencies are particularly strong for highly neurotic individuals, or if individuals' similarity to other animals is made salient. Research also shows that death primes increase support for the killing of animals in various domains (Lifshin, Greenberg, Zestcott, & Sullivan, 2017), presumably because this helps us feel superior to them.

THE COHERENT, ENDURING SELF

Although a positive, valued self provides a sense one is loved and protected, it is also important for people to believe in that valued self as a coherent entity that can exist beyond one's physical death. If the self is amorphous, so are its value and chances to transcend death. James (1890) observed that the self is temporally extended by symbolically reaching backwards and forwards in time by linking past with present experiences in preparation for future possibilities (Landau, Greenberg, & Solomon, 2008). Becker (1971, 1973) argued that individuals strive toward enduring symbolic immortality by creating and sustaining a coherent ongoing personal narrative. Thus, personal narratives serve a TMT function by symbolically weaving together

temporally distinct experiences into a journey of meaning and enduring significance (Landau et al., 2008).

A TMT function of a coherent self-narrative has been demonstrated in a variety of ways (see Chapter 5, this volume). Landau, Greenberg, Sullivan, Routledge, and Arndt (2009) asked participants to write short autobiographies after either an MS or control prime. Those primed with MS and who were high in personal need for structure (PNS; Thompson, Naccarato, Parker, & Moskowitz, 2001) wrote autobiographies that focused more on their personal identity as having importance in their lives than those low in PNS. Similarly, MS led those who were high in PNS to be more certain in their identity and to prefer causal explanations to random explanations for their recent experiences (Landau et al., 2009). In other words, for individuals who prefer structure in their lives, existential concerns facilitate greater investment in their personal self-concept and narrative.

Other studies have found that mortality concerns lead participants to interpret everyday behaviors with more meaning. For example, participants were asked whether "locking the door" was best described as "putting a key in a lock" or "securing the house." After MS, participants were more likely to describe the action as "securing the house" (Landau, Kosloff, & Schmeichel, 2011), which implies that existential concerns motivate individuals to imbue their actions with meaning. Additionally, they found that MS led participants to view their current behaviors as meaningfully connected to their future goals and to perceive their past experiences to be more influential in shaping their current self-concept. In each case, reminders of death served to bolster the participant's personal narrative by strengthening the connections between their past experiences, their present state, and their future goals.

Research on nostalgia also offers support for the terror management function of a self-narrative (see Chapter 8, this volume). After MS, individuals who were prone to having positive sentimental associations with one's narrative tended to report greater meaning in life and reduced DTA compared to those not prone to nostalgia (Routledge, Arndt, Sedikides, & Wildschut, 2006). Likewise Routledge et al. (2011) found that threatening meaning in life increased expressions of nostalgia. Experimental manipulations aimed at increasing nostalgia buffered participants against essays that primed meaninglessness (Routledge et al., 2011). Nostalgia also appears to bolster one's self-concept. Vess, Arndt, Routledge, Sedikides, and Wildschut (2012) found that reading about a nostalgic event increased associations between the self and positive traits, compared to reading about a positive future event.

In essence, a self-narrative sets the stage for symbolic immortality by creating a coherent story from which individuals can imbue their lives with enduring significance. Broadly speaking, from a terror management perspective, culture itself is a symbolic extended temporal account of reality (e.g., Landau et al., 2008), which allows an individual to position their personal

narrative into a meaningful effort toward self-continuity. Individuals who have a strong sense of such a personal narrative are therefore better buffered against existential threat (Sedikides, Wildschut, & Baden, 2004; Routledge & Arndt, 2005).

SELF-AWARENESS AND TERROR

> *Humans are conscious of their existence and thus conscious of the possibility of non-existence; ergo, they have anxiety.*
>
> John Cassavetes (McEndree & Cassavetes, 1959)

The vast majority of studies in the TMT literature have focused on the blessing side of the self, how a positive, coherent self contributes to effective terror management. However, another set of studies have focused on the curse side: that awareness of self is a prerequisite for awareness of one's mortality, and hence for the potential terror that the coherent positive self must help manage. Perhaps the most basic hypothesis based on this insight is that increasing self-awareness will increase DTA. Silvia (2001) supported this hypothesis in a study in which he had participants either sit in front of a mirror, a standard way to induce self-awareness (Duval & Wicklund, 1972) or describe their personality and what makes them unique. In both conditions, participants completed more death-related words in a fill-in-the-blank word search task than those in a neutral control condition. In a second experiment, participants who were placed in front of a mirror completed more death- and life-related words in the word-completion tasks than the control group, showing self-awareness primes dialectical thoughts about the self, of existence and nonexistence.

Arndt, Greenberg, Simon, Pyszczynski, and Solomon (1998) tested a related hypothesis that MS would make self-awareness especially aversive and thus provoke avoidance of stimuli that increase self-focus. In their first study, Arndt et al. placed the participants into cubicles with or without mirrors and asked them to write about their own death or taking their next important examination and, when done, leave the cubicle. In the MS condition, participants spent less time completing the writing task, and thus leaving the cubicle earlier, if there was a mirror in the cubicle. In the examination condition, the trend was in the opposite direction. In addition, participants wrote less about their own death if in the presence of the mirror.

In a second study, participants either completed a death anxiety scale or a worries about the future scale, and then wrote a story in which they either had to use self-referential or third-person pronouns. As predicted, participants who filled out the death questionnaire wrote shorter stories when they had to use self-referential pronouns, compared to the other three conditions. Arndt et al. also measured DTA at the end of this second study and hypothesized that writing about oneself would extend the suppression of

death-related thought after participants filled out the death questionnaire (for as previously discussed, suppression of death thought occurs when death is in active conscious focal attention [e.g., Pyszczynski, Greenberg, & Solomon, 1999], and because thinking about the self after MS can lead to thoughts about death, writing about oneself after MS kept death in focal attention). Thus, they also hypothesized that writing an externally-focused story after MS would not delay suppression. In support of this hypothesis, relative to the general worries control condition, DTA was elevated if participants wrote an externally-focusing story after MS, but not if they wrote a story about themselves. Recently, Christy, Sanders, Vess, Routledge, and Schlegel (2017) found that individuals high in PNS were less likely to endorse the existence of a "true self" after MS, despite the fact that high PNS individuals usually (without MS) harbor a belief in the true self as part of their worldview. Although more research is needed, there is clearly something about activating self-awareness that is troubling after MS.

This empirical evidence supports the role of self-awareness in increasing awareness of mortality. Beyond this link, e.g., Pyszczynski, Greenberg, Solomon, and Hamilton (1990) articulated a conceptual integration of TMT and self-awareness theory. They argued that self-awareness leads people to conform to personal values and strive for valued goals precisely because it brings mortality concerns closer to consciousness. Research directly assessing this proposition is yet to be conducted. They also proposed that when people are thwarted in achieving their more concrete goals, the more abstract goal of managing their existential terror of death is more likely to become accessible or conscious. This idea also has not been assessed directly; however, the evidence that threats to self-esteem increase DTA are consistent with this possibility. As Wisman (2006, p. 323) suggests: "[individuals] may attempt to lose symbolic self-awareness when symbolic solutions are not accessible or do not seem sufficient to solve the problem of death", such as "escaping" to drugs or alcohol.

MORTALITY SALIENCE, CREATIVITY, AND SELF-EXPANSION

Most MS research suggests that it leads to rigidity and defense of existing views of the self and the world. However, a line of research that began with examining effects of MS in the context of creative activities suggests MS can under some conditions contribute to openness and self-expansion. This research was initially based on Rank (1932) and Becker's (1973) assertions that true creativity involves taking actions outside or against the prevailing mainstream worldview, and thus is likely to arouse anxiety and guilt. It is asserting one's uniqueness, sticking out from others and risking security providing social validation, which may thus hark back to the angst-ridden childhood tension between one's efforts to individuate from the parents and yet maintain attachment to them. Over the history of art and science, we have

seen this many times as creative figures offer something new to the world and endure initial negative reactions for bringing something new to the prevailing worldview before then becoming validated as the world catches up to their creative achievements, sometimes, as in the cases of Franz Schubert and Vincent Van Gogh, only after they have died.

Based on these ideas, Arndt, Greenberg, Solomon, Pyszczynski, and Schimel (1999) predicted and found that after MS, engaging in a creative task led to feelings of guilt as well as an increased desire for social connectedness. This led Routledge, Arndt, Vess, and Sheldon (2008) to hypothesize that if after MS, creativity is framed as serving one's social groups, it may be embraced rather than arouse guilt. Supporting this idea, they showed that MS decreased creativity when the creative act was framed as having the goal of benefitting oneself (e.g., raising money for oneself), but MS increased creativity when the creative act was directed toward the community (e.g., raising money for charity).

Following up the idea that creativity separates self from one's worldview, Routledge, Arndt, and Sheldon (2004) found that creative actions after MS reduced worldview defense. This suggests that being creative following a reminder of mortality may temporarily lead to reduced identification with the mainstream worldview, which may in turn make people more open to alternative ways of looking at the world. To test this idea, Routledge and Arndt (2009) had participants think about either death or dental pain, and then they were either placed in the "creative" condition, where they were asked to come up with their own design for a T-shirt, or, in the control condition, to simply draw the room. The dependent measure was an established exploration scale. Participants in the MS condition who were then given the chance to be creative showed higher levels of social, intellectual, and environmental exploration than those in the control conditions. In another experiment, participants read a paragraph describing either that creativity is or is not culturally valued. As predicted, those who were primed with thoughts of death and then read that creativity is culturally valued scored higher on the subscale of cultural worldview exploration. Thus with mortality close to mind, creativity when engaged in or viewed as culturally valued seems to open people up to new ideas and experiences. Thus, while creativity combined with reminders of mortality may have the potential to increase guilt, it can also lead to openness to exploring and expanding the self. Perach and Wisman (2016) found that in particular, high levels of creative achievement and goals serve as an anxiety-buffer after MS (less DTA), whereas low levels do not (see their article for a review and mini metaanalysis of creativity and MS research).

Vail, Arndt and Breshears (2014) and Vail, Arndt and Pope (2014) suggested another set of conditions that might combine with MS to encourage self-expansion. Consistent with Maslow's (1943) idea that people whose deficit motives are fulfilled can shift focus toward growth motives, they

reasoned that when people have the basic needs fulfilled—using those specified by Deci and Ryan (2003) as relatedness, competence, and autonomy—then they may be sufficiently secure to respond to MS with a desire to self-expand and grow. Supporting this idea, Vail and colleagues found that MS increased worldview defensiveness and DTA among individuals with low, but not high, need-satisfaction; MS also increased motivation to experience need-satisfaction, develop need-satisfying environments, and engage in need-satisfying activities (Vail et al., 2014). Further, when people with high need-satisfaction were reminded of death, they reported feeling more meaning in life, stronger interest in personal growth, and more openness to novel experiences (Vail et al., 2014).

OTHER REMAINING ISSUES AND A NEW DIRECTION

TMT is clearly a theory about the self—how we cope with the awareness of ourselves as vulnerable, mortal beings in the world. As shown in this chapter, there are many facets to the role of the self in terror management. There is also plenty of room for additional research to further elucidate these facets. More work is needed to clarify when high self-esteem leads to less defense of worldviews and when it leads to more. Research is needed to further delineate the features of self-esteem that contribute to constructive and destructive consequences for the self and others. And additional research is sorely needed to further explore how mortality concerns can contribute to self-expansion, and how cultural construals of self may vary in the ways they guide their members toward terror management.

Many individual differences in how aspects of the self (in addition to self-esteem) affect terror management have been explored. We have chosen not to focus on these in this chapter, but much has been and can continue to be learned about the role of the Big Five personality dimensions, need for structure, authoritarianism, attachment styles, and other such variables.

It is also possible to consider other individual differences that may be particularly pertinent to varieties of terror management. For one example, in our laboratory, inspired partly by the work of Goldenberg and colleagues, we have begun studying the influence of the level of one's belief in the self's similarity to animals. We hypothesized that cultural worldviews function to reduce people's perceived similarity to animals (PSA). If this is indeed true, then cultural-worldviews affirmation should in turn reduce PSA. In support of this hypothesis, we have found that American participants who read an article that glorifies the American culture reported less PSA compared to Americans who read a control article glorifying New Zealand (Lifshin, Greenberg, Helm, & Sullivan, 2017).

After confirming this idea, we further hypothesized that if national identity contributes to denying similarity to animals, then people who generally view themselves as dissimilar to animals (low PSA) should be more invested

in their cultural worldviews, particularly following MS. In a series of studies supporting this hypothesis, we found that: Americans who reported low PSA generally reported caring more about their American identity and perceived less similarity across human cultures; after MS, participants low in PSA defend their worldview more than participants high in PSA and more than participants in control groups; disassociating from animals mediated the effect of MS on worldview defense. Furthermore, considering that worldview defense sometimes necessitates having negative attitudes toward other worldviews, we also hypothesized that people low in PSA after MS would have more negative attitudes toward people from other cultures. In two experiments, we found that low PSA participants who thought about their mortality reported more negative attitudes toward people from other cultures. Interestingly, in both experiments we found that participants high in PSA rated people from other cultures more positively after thinking about death.

These results suggest that perceived similarity of self to animals may play a significant role in how much people invest in their cultural worldviews, and how prejudiced they are against people from other cultures. These findings also suggest that high PSA has the potential to defuse intercultural tensions and prejudice. Perceiving similarity to other animals seems to be associated with less disparaging of other cultures and may be associated with more constructive responses to reminders of death. Unlike the popular notion that the best solution to the problem of out-group dehumanization during intercultural conflicts is to try to perceive out-groups as more human, this research suggests that perhaps viewing *ourselves* as more *animal* (perhaps contributing to a feeling of unity with nature and other living beings) may be the key in reducing intergroup conflicts and prejudice.

We hope to continue this line of research to comprehensively examine the role that PSA may have on people's investment in cultural worldviews, and how this increased investment may affect a variety of human behaviors. For example, we anticipate researching how PSA may be related to adherence to cultural values, adoption of popular religious and political beliefs, norm following, and preference for more mainstream forms of art, fashion, and popular media, as these may help people reduce their PSA and thus serve their terror management. We also need to learn more about people high in PSA. Are they actually not in need of managing their potential terror or do they do so in less normative ways, for example, by relying on broader or more creative bases of terror management?

CONCLUSION

The self that is forged, defended, and expanded in order to manage the potential for anxiety engendered by the human awareness of vulnerability and mortality plays a central role in motivating the constructive and destructive things we humans do on this planet. The existing evidence tells us a

great deal about determinants of these positive and negative consequences. They are influenced by the stability with which the self is viewed as significant and enduring, the repertoire of prescribed paths to value provided by the individual's internalized worldview, and the particular routes to self-worth selected from that repertoire toward which an individual aspires. Empowered by this understanding of the functions of the symbolic self, as well as the many additional gains in knowledge offered by the other chapters in this handbook, there is no doubt much more we can still hope to learn about how we humans cope with our mortality.

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Chapter 8

Precious Time: The Role of Time and Temporal Thought in Managing Death Awareness

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That we shall die, we know. 'Tis but the time
And drawing days out, that men stand upon

Shakespeare (trans. 1988, 3.1. 99100)

Time and mortality are inextricably linked. For example, people often refer to aging and approaching death as running out of or being short on time. In this chapter we explore this issue from the perspective of terror management theory (TMT, Greenberg, Pyszczynski, & Solomon, 1986), reviewing evidence that passage of time is a reminder of death and thus a potential source of existential anxiety. Ultimately though, as Brutus points out in the opening quote from the Shakespearean classic *Julius Caesar*, time is what separates people from death, the thing that people have to "stand upon" in the battle against mortality. Therefore, we also consider the ways in which time is implicated in terror management defenses. First, we review evidence that people manage existential concern by denying their vulnerabilities to the ravages of time. Second, we discuss research that people structure their temporal experience to maintain a sense that their existence is coherent and purposeful when confronting the threat of mortality. Third, we summarize findings that people use mental time travel in their efforts to shield themselves from the potential for existential anxiety. Finally, we discuss evidence that people can manage the threat of death by embracing the present.

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DEATH AND TIME

A central premise of TMT is that humans, like all species, have an innate predisposition toward survival. However, unlike the vast majority of animals, humans are self-aware and have the cognitive capabilities to reflect on past experiences and imagine future potentials. The unfortunate psychological consequence of mental time travel, according to TMT, is the awareness that death is an inevitable part of existence. This awareness of mortality has the potential to arouse fear and anxiety (Greenberg et al., 1986; Pyszczynski, Greenberg, & Solomon, 1997). Thus, the passage of time is a potent reminder of mortality and a potential source of existential anxiety (Arndt, Routledge, & Bultman, in press; Routledge & Arndt, 2005).

Support for the notion that the passage of time is a reminder of mortality and source of existential anxiety comes from research looking at the relation between aging and death-related concerns. Age-related changes to appearance are a stark reminder of the ravages of time and people go to great lengths (e.g., cosmetics, plastic surgery) to mask them. Research indicates that the concern about looking old is rooted in the fear of death. For example, Chonody and Teater (2015) assessed attitudes about aging, death anxiety, and dread about looking old in a sample of undergraduate students from three English-speaking countries (i.e., the United States, England, and Australia), and found that death anxiety was predictive of greater dread about looking old, even after controlling for negative attitudes about aging.

Experimental research also indicates that reminders of aging activate death-related concerns (Martens, Greenberg, Schimel, & Landau, 2004). In one study, for example (Martens et al., 2004, Study 1), college students were exposed to pictures of either younger or older adults and subsequently completed a death-thought accessibility (DTA) measure (Greenberg, Pyszczynski, Solomon, Simon, & Brues, 1994; see Chapter 4, this volume, for detailed information). The measure assesses the cognitive accessibility of death-related thoughts using a word stem completion task where participants complete 26 word stems, 8 of which can be completed in a death or neutral relevant manner (e.g., GRA_ _ could be completed as GRAVE or GRAPE). The results revealed that research participants who were exposed to pictures of elderly adults completed more word fragments in a death relevant manner than did participants who were exposed to pictures of younger adults. Taken together, reminders of the passage of time activate death-related concerns and have the potential to arouse existential anxiety.

DEATH AND TIME DENIAL

Reminders of the passage of time are existentially problematic and inevitable. According to TMT, however, people can ease existential anxiety by

maintaining psychological distance between themselves and the problem of death, thereby denying their vulnerability to death (Greenberg et al., 1986; Pyszczysnki, Greenerg, & Solomon, 1999; Pyszczynski et al., 1997). Indeed, research has demonstrated that death reminders motivate efforts to symbolically distance oneself from the problem of death (for a review, see Burke, Martens, & Faucher, 2010).

To the extent that time and death are linked, people may ease their existential anxiety by distinguishing themselves from those temporally closer to death. Research by Martens et al. (2004) provided support for this possibility by demonstrating that death reminders motivated young college-aged adults to distance themselves from elderly adults. In one study for example, college-aged participants were instructed to write about death (the mortality salience (MS) condition) or dental pain (the control condition) and subsequently rated the extent to which a number of statements (e.g., "I am a very sociable person") characterized themselves, as well as a number of other groups of people, including elderly people and teenagers. Young adults reminded of death rated elderly adults, but not teenagers, as being less similar to themselves than did young adults reminded of the dental pain. A second experiment found that the aforementioned effect was moderated by how similarly young adults had rated their personality to the personality of an average older adult in a previous questionnaire. Specifically, the effect was most pronounced among people who had previously reported a high similarity between themselves and the average older adult. Taken together these two studies suggest that people manage mortality concerns by distancing themselves from the effects of time (i.e., aging), since death reminders motivated young adults to see themselves as very different from older adults.

A package of studies by Martens and Schmeichel (2011) provided further evidence that temporally distancing oneself from death may ease existential concerns, by demonstrating that death-related concerns motivate people to perceive time as passing more slowly. In two studies, the researchers found that people who self-reported thinking about death more frequently were more likely to overestimate the temporal distance between two events. In a third study, Martens and Schmeichel provided experimental evidence that mortality concerns lead people to perceive time as passing more slowly. Specifically, participants were subjected to MS or social exclusion salience, and then were instructed to sit and wait for the experimenter to bring them an additional packet of questionnaires. After 42 seconds the experimenter returned with the questionnaires and instructed the participants to estimate how long they had waited for the experimenter to return. Participants in the MS condition estimated that the wait took longer than participants in the social exclusion condition. Taken together, the threat of death led people to perceive time as moving more slowly, providing further evidence that existential concerns motivate people to temporally distance themselves from death.

DEATH AND STRUCTURING TIME

Of course no one is immune to the effects of time, so this strategy of distance and denial to temper death-related anxiety is very limited. However, people can reduce existential angst by structuring time to make its progression feel more certain and purposeful. Indeed, existential scholars have long mused that a threatening aspect of the human condition is the potential awareness that life is an unpredictable and meaningless assortment of experiences that lead to death (Frankl, 1959; Lifton, 1983; Sartre, 2007), and TMT proposes that people are motivated to invest in cultural worldviews, in part, because they provide people with a set of beliefs that make life feel predictable, structured, and purposeful. Research supporting TMT indicates that death reminders lead to an increased defense of worldviews, such as religion, national identity, and political affiliation (for a review see Burke et al., 2010), and that this defensive process is partially explained by the need for structure. Specifically, people with a chronic desire for structure are more likely to respond to MS by rigidly defending cultural worldviews (Juhl & Routledge, 2010).

People can also gain a sense that life is predictable, structured, and purposeful by structuring their personal existence across time. Indeed, there is a strong need for people to view themselves as having temporally stable personality characteristics and self-attributes (Erikson, 1968; Vignoles, 2011), and to perceive their life experiences as contributing to a coherent life story (e.g., McAdams, 2001). Moreover, people structure their present existence with predictable routines and specific goal pursuits. From a terror management perspective, this tendency is motivated, in part, by the need to ease the potential for anxiety associated with the awareness of mortality. In support of this, research indicates that MS motivates efforts to temporally structure one's identity.

To begin, MS motivates people to structure their personal past in a way that is clear and coherent (Landau, Greenberg, & Sullivan, 2009; Landau, Greenberg, Sullivan, Routledge, & Arndt, 2009). Specifically, Landau, Greenberg, Sullivan, Routledge, et al. (2009) found that in response to MS, participants high in need for structure were more likely to express a desire to find a clear identity when writing about their past experiences, compared to control participants high in need for structure. MS also motivates people to structure their personal past in a causal fashion. For example, Landau et al. found that research participants high in need for structure who were exposed to MS used more causal language when writing about past experiences than did high need for structure participants in an intense pain salience control condition. Moreover, Landau, Kosloff, and Schmeichel (2011) found that MS increased the extent to which participants believed that changing an event from the past would change the person they have become.

Structuring the past as coherent and causal appears to help people manage existential anxiety. For instance, research has evidenced that MS motivates compensatory efforts to affirm the importance of the past when a persons' sense that the past is coherent and causal is threatened, but not when it is affirmed (Landau et al., 2009). Specifically, research participants were exposed to an MS or social exclusion salience manipulation, as well as one of three autobiographical coherence manipulations. In the no-threat—chronological control condition, participants ordered 20 of their life events chronologically. In the no-threat—thematic control condition, participants organized life events into themes like embarrassment and fear or accomplishments. And in the autobiographical coherence threat condition, participants organized their life events alphabetically. After the life event organizational task, participants indicated the extent to which they viewed their past as important/significant. Participants subjected to MS in the autobiographical coherence threat condition rated the past as more significant, than did participants subjected to MS in either of the no-threat control conditions and participants subjected to social exclusion salience in the autobiographical coherence threat condition. There were no significant differences between MS and social exclusion in either of the no-threat conditions. Taken together, participants engaged in compensatory affirmation of the past in response to MS when they ordered the past in an incoherent fashion, but did not when they ordered their past in a coherent fashion. Thus, this study provides evidence that affirming the passage of time as coherent mitigates defensive responses to MS supporting the notion that structuring the past eases existential anxiety.

TMT research indicates that death reminders also influence how people perceive and structure their time on a day-to-day basis. Specifically, Landau et al. (2011) demonstrated that following an MS manipulation people were more likely to describe hypothetical actions in terms of the higher level purpose that they serve. This evidence suggests that death reminders lead people to construe their day-to-day activities as purposeful. In a follow-up study, Landau et al. found that MS influences how people structure their time to accomplish future aspirations. In the study, research participants were first asked to list five long-term personally important goals, as well as a couple of sentences summarizing each goal. The participants then completed a separate packet of questionnaires that contained an MS or a social exclusion manipulation and filler questionnaires. Finally, participants completed a measure of perceived continuity between their present actions and future goals in which they indicated which of their daily activities contributed to each of the five goals they previously listed. Participants in the MS condition indicated that more of their daily activities were connected to their goal pursuits than did participants in the social exclusion condition. Once again, the study indicates that death reminders motivate people to perceive their actions as causal. Moreover, this study demonstrates that people are motivated to structure their time to advance future goals as a way to manage existential terror.

DEATH AND MENTAL TIME TRAVEL

Structuring time allows people to feel that life is not unpredictable march to death. Structuring time also sets up mental time travel as an activity that can manage as opposed to exacerbate existential terror. For example, people can gain a sense that their lives are meaningful in reflecting on their past accomplishments and relationships. Indeed, research indicates that people are inclined to see the past as valuable and are drawn to their personal past when confronted with death reminders (McCabe, Spina, & Arndt, 2016; Rudert, Reutner, Walker, & Greifeneder, 2015). Moreover, research on nostalgia suggests that reflecting on personally meaningful and cherished memories plays a crucial role in bolstering psychological defenses that help people manage the threat of mortality awareness.

Specifically, TMT proposes a psychological anxiety buffer consisting of cultural worldviews, self-esteem, and attachment relationships, that provides people with meaning, permanence, value, and belonging, which they rely on for comfort and security in the face of their awareness of their mortal nature (for a review, see Hart, Shaver, & Goldenberg, 2005). Nostalgia is a mostly positive emotional experience that involves reflecting on cherished memories of persons and events (Routledge, 2015; Sedikides et al., 2015; Wildschut, Sedikides, Arndt, & Routledge, 2006). Nostalgic memories are meaningful memories, typically focusing on personally significant life events, such as weddings, graduations, religious ceremonies (Wildschut et al., 2006), featuring themes of agency/self-growth (Abeyta, Routledge, Roylance, Wildschut, & Sedikides, 2015; Wildschut et al., 2006; Hart et al., 2011), and containing references to meaningful social bonds (Abeyta, Routledge, Roylance, et al., 2015; Abeyta, Routledge, & Juhl, 2015; Wildschut et al., 2006). As a revisiting of peoples' most meaningful social relationships, achievements, and experiences, nostalgic reminiscence has been found to boost self-worth (Vess, Arndt, Routledge, Sedikides, & Wildschut, 2012; Wildschut et al., 2006), support the need for social belonging (Abeyta et al., 2015; Wildschut et al., 2006; Wildschut, Sedikides, Routledge, Arndt, & Cordado, 2010), and bolster perceptions of meaning in life (Routledge et al., 2011; Routledge, Wildschut, Sedikides, Juhl, & Arndt, 2012). Thus, in strengthening self-esteem, promoting social belonging, and fostering meaning in life, nostalgia should be fuel for the existential anxiety buffer.

If nostalgia strengthens the existential anxiety buffer and in turn helps people manage existential threat, then people who regularly engage in nostalgic reflection should be better able to manage the threat of death reminders (Routledge & Arndt, 2005). A number of studies have provided support for this proposition. To begin, terror management research indicates that mortality reminders increase the accessibility of death-related thoughts (Greenberg et al., 1994), but that engaging in symbolic TMT defenses (Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997) following a death

reminder or bolstering self-esteem before a death reminder (e.g., Harmon-Jones et al., 1997; Schmeichel & Martens, 2005) ameliorates this DTA increase. Building from these findings, Routledge, Arndt, Sedikides, and Wildschut (2008) found that the propensity to engage in nostalgia buffers the effect of MS on DTA. Specifically, Routledge et al. measured nostalgia proneness, defined as the frequency with which people engage in nostalgic reflection and the importance they assign it, subjected participants to an MS or pain salience condition, and finally assessed DTA. MS, relative to pain salience, led to the typical increase in DTA. However, this effect was only found at low levels of nostalgia proneness. Thus, MS did not lead to the typical increases in DTA among those who frequently engage in nostalgia, supporting the proposition that nostalgia helps people manage the threat of death awareness.

Research has also supported the proposition that people who regularly engage nostalgia are better able to manage existential threat by providing evidence that nostalgia proneness buffers cultural worldview defense. The TMT literature indicates that one way people affirm the legitimacy and importance of their worldview is by diminishing or derogating opposing viewpoints (Greenberg & Kosloff, 2008; Greenberg et al., 1990). A study by Juhl, Routledge, Arndt, Sedikides, and Wildschut (2010) tested whether nostalgia buffers the tendency to derogate those who challenge one's worldview in a sample of undergraduate students by measuring their levels of nostalgia proneness, subjecting them to an MS or pain salience condition, and finally having them evaluate the writer of an essay that criticized their university. The researchers observed the typical pattern of worldview defense among those who scored low in nostalgia proneness, such that students who were subjected to MS evaluated the critical essay writer more negatively than students subjected to pain salience. However, this effect was not found at higher levels of nostalgia proneness.

A more extreme method of cultural worldview defense found in the TMT literature is the willingness to sacrifice oneself on behalf of a group or ideology. Specifically, death reminders were found to increase the extent to which Iranian college students supported and were willing to volunteer for martyrdom attacks (Pyszczynski et al., 2006). A study by Routledge, Juhl, Abeyta, and Roylance (2014) provided further evidence that people who regularly engage in nostalgia are better able to manage existential terror, by providing evidence that regularly engaging in nostalgia buffers this more extreme form of cultural worldview defense. Specifically MS, relative to pain salience, was found to increase willingness to sacrifice oneself on behalf of her or his nation, but only among those relatively low in nostalgia proneness. Thus, the propensity to engage in nostalgia eliminated the need for people to defend their worldview by supporting nationalistic self-sacrifice.

Research has also supported the proposition that people who regularly engage in nostalgia are better at managing death concerns by providing

evidence that nostalgia proneness buffers the downstream psychological consequences of MS. Research has found that death reminders lead to psychological consequences like decreased meaning and well-being, as well as increased general and death-related anxiety when people are not given the opportunity to engage in symbolic defenses (Abeyta, Juhl, & Routledge, 2014; Routledge & Juhl, 2010; Routledge et al., 2010). However, research indicates that regularly engaging in nostalgia shields people from these downstream psychological consequences. Specifically, a study by Routledge et al. (2008) found that death reminders increased the sense that life is meaningless, but that this effect was only significant at low levels of nostalgia proneness. Similarly, Juhl et al. (2010) found that MS, relative to pain salience, led to increased death-related anxiety among those who scored low, but not high, in nostalgia proneness. Thus, people who regularly engage in nostalgia do not experience the downstream psychological consequences brought on by mortality reminders and therefore appear to be better equipped to manage existential threat.

The studies just described all suggest that people who regularly engage in nostalgic reverie are better at managing existential threat, but does not provide direct evidence that nostalgic reminiscence reduces death-related cognitions. A study by Routledge et al. (2010) provided more direct evidence that nostalgia buffers the effects of MS by manipulating nostalgia instead of measuring nostalgia proneness. In this study, nostalgia was manipulated using an event reflection writing task that instructed research participants to bring to mind and write about a nostalgic or ordinary memory. Next, MS or failure salience was manipulated, and finally, after a brief distraction task, DTA was assessed. In the ordinary writing condition, MS, relative to failure salience, increased DTA. However, in the nostalgic writing condition, there was no significant effect of MS on DTA. Thus, engaging in nostalgic reflection shielded people from the effects of MS.

Finally, inasmuch as nostalgia strengthens the anxiety buffer and helps manage the threat of death, people should recruit nostalgia in the face of existential threat. To evaluate this potential, Juhl et al. (2010) measured nostalgia proneness, subjected a sample of research participants to an MS or pain salience, and assessed state nostalgic feelings. Results indicated that MS, relative to pain salience, increased state nostalgia among highly nostalgia prone people. Thus, people who regularly engage in nostalgia recruit nostalgia to cope with existential terror.

In sum, the research establishing nostalgia as an existential resource suggests that mental time travel can be harnessed to manage the threat of death reminders. Nostalgia strengthens the existential anxiety buffer by fostering feelings of social connectedness, encouraging self-esteem, and bolstering meaning in life. In doing so, nostalgia counters heightened DTA, reduces the need to rely on symbolic defenses to manage existential concerns, and prevents the negative downstream psychological consequences of MS.

People may also make use of mental time travel to the future to manage existential concerns. As previously mentioned, MS motivates people to view their day-to-day actions as purposeful, leading them to future potentials (Landau et al., 2011). Reflecting on desired future potentials gives people a framework with which to live by and a sense that actions are contributing to something meaningful (e.g., McGregor & Little, 1998). Thus, the sense of purpose and significance gained from thinking about and planning future goals/potentials should have utility when managing the potential for existential terror. Indeed, research indicates that MS motivates people to place value in the future (Kelley & Schmeichel, 2015). Moreover, research indicates that imagining future potentials buffers the effects of MS. Specifically, a study by Vess, Rogers, Routledge, and Hicks (2016) found that MS, relative to uncertainty salience and a neutral condition, decreased perceptions of meaning in life when people were made to feel like they were close to completing a long-term goal. However, this effect of MS was not significant when people were made to feel like they were far from achieving a long-term goal. Thus, thinking about a distant future potential eliminated the deleterious effect of MS on meaning in life. Setting goals and planning for the future provides people with meaning and purpose and is one way that mental time travel to the future can help people manage the threat of mortality.

From a terror management perspective, mental time travel to the future should also have existential utility because the ability to project forward in time is central to the quest for symbolic and literal immortality. Briefly, a tenet of TMT is that people invest in cultural worldviews in part to achieve a sense of literal and/or symbolic immortality. Literal immortality involves beliefs that the self can transcend death by gaining entrance into an afterlife or otherwise extending life indefinitely, whereas symbolic immortality involves believing that the self can transcend death by leaving behind a material, cultural, or genetic legacy. Mental time travel allows people to imagine a future beyond their physical existence where they have symbolically or literally transcended death. A variety of studies have evaluated the potential for symbolic and literal immortality to buffer the effects of MS.

Literal immortality beliefs are most commonly associated with religious beliefs of a spiritual afterlife. Dechesne et al. (2003) tested whether providing evidence for a future spiritual afterlife would buffer the effects of MS on the pursuit of self-esteem and cultural worldview defense. This research found that presenting participants with information supporting the existence of a spiritual afterlife, relative to information refuting a spiritual afterlife, reduced the tendency for MS to increase efforts to bolster self-esteem and for MS to lead to stricter punishments for individuals who violate cultural norms. Heflick and Goldenberg (2012) replicated this effect on a sample of atheists, showing that evidence for a spiritual afterlife reduced worldview defense following MS even among people who reject religion. Taken

together, these studies indicate that people can manage existential concerns by imagining a literal existence beyond physical life.

Future-oriented mental time travel also allows people to imagine how they may symbolically transcend death. Research has demonstrated that death-related thoughts motivate people to seek out opportunities for symbolic immortality. For example, MS was found to increase the desire to be famous and made people more interested in having a star named after them (Greenberg, Kosloff, Solomon, Cohen, & Landau, 2010). Moreover, research has demonstrated that MS increases the desire to create a genetic legacy by having children (Fritsche et al., 2007; Wisman & Goldenberg, 2005). Research has also demonstrated that symbolic immortality buffers the effects of MS. For example, Fritsche et al. (2007) found that having people think about having children eliminated the effect of MS on the in-group bias. Additionally, research by Florian and Mikulincer (1998) evidenced that people who had a high sense that some part of themselves would live on beyond their death did not display the same defensive response to MS of punishing a social transgressor as did people with a weaker sense of symbolic immortality. Taken together, people are motivated to seek opportunities for symbolic immortality in response to death reminders, because feeling a strong sense that part of themselves will symbolically transcend death helps manage the potential for existential terror.

In sum, future-oriented mental time travel enables people to imagine a future beyond the grave, where they have achieved literal or symbolic immortality. This is because the future-oriented thinking is essential for planning and pursuing goals that ensure one can gain entrance into a spiritual afterlife or leave behind a symbolic legacy.

DEATH, LIMITED TIME, AND PRESENT FOCUS

Thus far we have discussed that the link between time and death can be existentially problematic, but that people manage this threat by distancing themselves from and denying their vulnerability to effects of time, constructing a coherent and purposeful temporal identity, and gaining existential security by engaging in mental time travel to the past and future. A final way that people can negotiate the link between time and mortality is by embracing the present.

First, terror management research on age-related differences in the effects of MS suggests that people manage existential anxiety late in life by prioritizing present emotional satisfaction. Specifically, Maxfield et al. (2007) explored age-related differences in worldview defense in response to MS by exposing a sample of undergraduate students and older adults to an MS or control manipulation and subsequently having them assign punishments to social transgressors. MS led to the typical pattern of harsher punishments among the young adults, but did not among older adults. In a follow-up study, the researchers replicated the effect and also showed that a more

subtle death prime (i.e., a word search with death-related words embedded in it) led to more lenient punishments for moral transgressors among older adults. Taken together, despite being temporally closer to death, older adults reacted to the threat of death with less negativity.

Building from this initial study, Maxfield et al. (2014) investigated the effect of MS on generative concern. The generative concern, which is defined as the desire to give back or pass on knowledge to younger generations, has long been theorized as a developmental milestone in mid- to late life linked to psychological well-being (Erikson, 1968). Because generative concern increases with age, Maxfield et al. reasoned that older adults might turn to generativity to maintain a sense of purpose and transcendence when managing death-related concerns. In contrast, young adults should be less inclined to turn to generativity as a terror management strategy. The researchers found that an MS manipulation, relative to a control manipulation, increased generative concern and prosocial orientation among older adults, but had no effect on generative concern and prosocial orientation among younger adults. Once again, this research demonstrates age-related differences in terror management defenses.

One explanation for the age-related differences in terror management defense has to do with the fact that as people age they begin to perceive time as being limited. According to socioemotional selectivity theory (Carstensen, Isaacowitz, & Charles, 1999), limited time perspective leads to a shift in value orientation, such that people who perceive time as being limited prioritize experiences and goals that lead to a present sense of internal or emotional satisfaction, as opposed to experiences and goals that lead to external rewards. Thus, these more positive and prosocial terror management defenses observed among older adults may be explained by the value shift brought on by a limited time perspective.

Research by Cozzolino, Sheldon, Schachtman, and Meyers (2009) examined the link between limited time perspective and more positive terror management defenses. Specifically, they tested whether inducing a limited time perspective when contemplating mortality would lead to a shift away from self-serving behavior among people with an extrinsic value orientation (i.e., those who place high importance on materialism, wealth, and popularity). Undergraduate research participants completed a measure of extrinsic value orientation and were then subjected to one of two MS conditions. In the limited time perspective MS condition, they were instructed to contemplate death while imagining that they were 75 years old, whereas in the standard MS condition, the participants were instructed to contemplate death without specifying how much time they had left. Following the manipulation and a delay, the participants were given the opportunity to take raffle tickets for a prize drawing, and specifically were told they could take as many as they wanted but should save some for future participants. Participants who highly valued extrinsic goals in the limited time perspective MS condition took fewer raffle tickets than participants who

highly valued extrinsic goals in the standard MS condition. Thus, inducing a limited time perspective when contemplating death resulted in a value orientation shift; people who highly valued materialism became less greedy.

Consistent with the research on terror management and older adults (Maxfield et al., 2007, 2014), the Cozzolino et al. (2009) research suggests that limited time perspective influences the ways in which people manage the threat of death. Instead of being overcome with fear that time is running out and death is closing in, managing existential threat in old age or when time is limited appears to involve embracing the valuable time left by concentrating on internally derived and emotionally satisfying ambitions such as giving back to future generations, instead of being driven by external rewards.

Research on the existential utility of mindfulness also supports the notion that people can manage the threat of death by embracing the present. Theoretical perspectives posit that mindfulness, defined as a hyper focus on present experiences as well as a receptive and nonjudgmental mode of processing, benefits self-regulation and psychological well-being (Brown, Ryan, & Creswell, 2007). Research indicates that people can better manage threats when in a state of mindfulness because this state is associated with reduced emotional reactivity and more adaptive responses (for a review, see Brown et al., 2007). Building on this research that mindfulness benefits well-being and self-regulation, Niemiec et al. (2010) tested whether mindfulness buffers worldview defense following death reminders. They did so by measuring trait mindfulness, manipulating MS, and assessing a variety of worldview defense outcomes. In general, the researchers found that MS, relative to control manipulations, engendered worldview defenses such as in-group bias, at low but not high levels of trait mindfulness. Thus, more mindful individuals did not respond to MS by defending meaningful worldviews.

Additionally, Niemiec et al. (2010) explored explanations for the lack of defensive response to MS among mindful people. First, they recorded how long people spent writing during the MS or control manipulation and then examined the extent to which time spent writing explained the reduced defensiveness among people high in trait mindfulness. People high in trait mindfulness spent more time writing about death, which in turn predicted a less defensive response to MS. The researchers also investigated the extent to which mindful people engaged in death-thought suppression as a potential explanation for the lack of defensiveness. Research supporting the dual-process model of TMT indicates that people engage in proximal defenses immediately after encountering a death reminder that work to suppress death-related thoughts (Pyszczysnki et al., 1999). Supporting the initial suppression of death-related thoughts, research has found that DTA is low immediately after MS, but then increases after a delay (Arndt et al., 1997; Burke et al., 2010; Greenberg et al., 1994). Consistent with this past research, the researchers found that among people low in mindfulness, MS increased DTA following a delay but not immediately. However, among those high in mindfulness,

MS increased DTA immediately but did not after a delay. Thus, mindful people did not engage in the typical suppression of death thoughts.

Taken together, people may also gain existential benefits from focusing on the present. Mindful people do not respond to the threat of mortality in a defensive manner. Consistent with the notion that mindfulness is characterized by an intense focus on the present, people high in trait mindfulness spent more time considering their mortality when prompted to do so, which partially explained this less defensive response. Moreover, consistent with the notion that mindfulness is characterized by an open and nonjudgmental approach to the present, mindful people did not engage in the immediate conscious suppression of death-related thoughts. Thus, a focused and open approach to the present appears to be an additional temporal strategy for managing existential terror.

CONCLUSION

> *People think in terms of good and evil when really time is the true enemy of us all. Time kills everything*
>
> Feige and Derrickson (2016)

In the battle against mortality it is easy to see time as the enemy. Indeed, TMT proposes that it is humans' ability to understand time and to mentally traffic in time that gives rise to the awareness of mortality and the potential for existential anxiety. Moreover, research supporting TMT indicates that reminders of the passage of time give rise to death-related thoughts and worries. As we have discussed in this chapter, the link between time and death motivates people to avoid and deny the effects of time. However, as the sports adage "father time is undefeated" suggests, ultimately, no one can avoid the reality of time. Fortunately, the same mental capacities that enable an understanding of time and mortality allow people to maintain a coherent and purposeful temporal existence and give them the ability to find existential strength and comfort through mental time travel. Moreover, peoples' understanding of time motivates them to fully embrace their precious time left and facilitates movement to a psychologically adaptive value orientation. In this way, time can be an ally, helping people manage the fear of inevitable death.

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Chapter 9

Terror Management Is for the Birds and the Bees: An Existential Perspective on the Threat Associated With Human Corporeality

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"Why did man not go insane in the face of an existential contradiction between a symbolic self, that seems to give man an infinite worth in a timeless scheme of things, and a body that is worth about 98 cents?" (Fromm, 1955, p. 34). With this question, Erich Fromm captures the underlying sentiment of what is now a substantial body of work on the psychological predicament associated with human corporeality. This issue resonated with Becker (1973) as well, who pondered that "man is out of nature and hopelessly in it; he is dual, up in the stars and yet housed in a heart-pumping, breath-gasping body that once belonged to a fish and still carries the gill-marks to prove it. His body is a material fleshy casing that is alien to him in many ways—the strangest and most repugnant way being that it aches and bleeds and will decay and die" (p. 26). Building on such theorizing, and that of other existential oriented thinkers (Norman O. Brown, Otto Rank, and also, Sigmund Freud), terror management theory was expanded (cf Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000) to address such concerns.

Central to terror management, the body is the vehicle through which life courses and then passes unto death. If not for one's physical nature, a person might be inclined to believe they could live forever. Thus, while terror management theory focuses on the very specific threat associated with the awareness of mortality, it is not only the awareness of mortality that people must defend against. In a sense, that's easy. Death only occurs once in lifetime.

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The corporeality of the human body is much harder to deny. It becomes salient every time one looks in a mirror, goes to the bathroom, steps on a scale, or takes a lover to bed. No matter how much one tries to make their appearance more appealing or imbue physical acts with meaning and significance, there is no getting around the fact that humans are physical creatures. It would seem that humans are caught in a struggle between, on one hand, the need to deny mortality; and on the other, being reminded that they are flesh and blood creatures with animalistic needs and desires. Thus, just like any other animal, they are unquestionably and definitively doomed to die.

It is not surprising then that terror management theory has focused a good amount of attention on defenses that target the body and sex (Goldenberg et al., 2000). Women have been a particular focus of this work, for the reason that their bodies have specific, and distinctive, features making the connection to life and death especially palpable (Goldenberg & Roberts, 2004). This perspective lends itself as an explanatory mechanism for the pervasiveness and perpetuation of the objectification of women's bodies. Moreover, terror management not only has implications for psychological needs, but also physical well-being, since health behaviors often require confrontations with the most corporeal aspects of the body. This chapter consists of an overview of the work that has been done to date on these topics (for earlier reviews, see Goldenberg, 2005, 2012), and ends with consideration of whether there is any alternative solution to terror management, freeing individuals to embrace their corporeality without defensiveness.

AN EXISTENTIAL PERSPECTIVE ON THE THREAT OF HUMAN CORPOREALITY

As is likely clear by now, research on terror management theory (Greenberg, Pyszczynski, & Solomon, 1986) depicts a need to defend against anxieties resulting from heightened death-thought activation with a wide array of defenses that are symbolic in nature (in contrast to proximal defenses, more rationally oriented responses that occur when thoughts about death are conscious) (Chapter 2: Proximal and Distal Terror Management Defenses: A Systematic Review and Analysis; Pyszczynski, Greenberg, & Solomon, 1999). For example, people increase their investment in political (McGregor et al., 1998), religious (Greenberg et al., 1990), and national ideologies (Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992) when thoughts of death are made accessible through primes aimed at inducing mortality salience (i.e., activation of death awareness below the level of consciousness). The theory maintains that it is through these symbolic investments that human beings derive meaning and value, raising themselves to a more significant and less blatantly mortal, existence. The body, however, contradicts the symbolic construction of the self—"it aches and bleeds and will decay and die" (Becker, 1973, p. 26). Understanding how human beings manage this contradiction was a starting point for investigation (see Goldenberg et al., 2000).

One hypothesis central to this work is that, to the extent that existential difficulties arise in response to the physical nature of the body, when existential concerns are exacerbated with mortality reminders, the physical aspects of the body should be especially threatening. Supporting this, there is evidence that basic disgust reactions toward animals, as well as the body, its products, and processes, increase in response to reminders of mortality. In one study (Goldenberg et al., 2001), participants were prompted to write about their own death, or a control topic, and then completed a disgust sensitivity questionnaire (Haidt, McCauley, & Rozin, 1994). On the bodily products ("You see a bowel movement left unflushed in a public toilet") and animals ("seeing a cockroach in someone else's house does not bother me") subscales, disgust responses were elevated in response to mortality priming. Moreover, these reactions were only exhibited in a condition where a delay followed the mortality priming (allowing death thoughts to recede from consciousness), suggesting that disgust represents a distal and symbolic means of coping with the problem of death (cf Pyszczynski et al., 1999), and not a rational or proximal threat response.

In addition, Goldenberg et al. (2001) demonstrated that even without inciting disgust, people are threatened when humans are described as being similar to other species, or more specifically, described as animals (i.e., human creatureliness). In this study, college students were presented with an essay purportedly written by an honors student at another local university in response to the topic of, "The most important things I have learned about human nature." In one condition, the essay argued that, "...the boundary between humans and animals is not as great as most people think." It went on, suggesting that, "Although we like to think that we are special and unique, our bodies work in pretty much the same way as the bodies of all other animals. Whether you're talking about lizards, cows, horses, insects, or humans, we're all made up of the same basic biological products." Alternatively, another essay claimed, "Although we humans have some things in common with other animals, human beings are truly unique." It emphasized, "Humans have language and culture. We create works of art, music, and literature that enable us to live in an abstract world of the imagination—something no other animal is capable of." When participants were first primed with mortality salience, they showed clear preference for the essay emphasizing human uniqueness, compared to the essay emphasizing human creatureliness. There was no difference in essay preference for participants not primed with mortality; moreover, between the mortality and control condition, priming thoughts of death led to stronger preferences for the human uniqueness essay. Thus, the threat of human creatureliness not only elicited the motivation to deny one's animality, but also the compensatory response of bolstering the symbolic aspects of humanity and elevating one's status in the ranks of species.

Other research has utilized these essays to prime human creatureliness as well, with the assumption being that reminding individuals of the similarity between humans and other animals creates a mind-set where human creatureliness is salient, and the body is cast in a threatening light. Cox, Goldenberg, Pyszczynski, and Weise (2007) examined this by assessing the accessibility of death-related cognitions (using a word completion task [e.g., COFF _ _] in which words could be completed as death related ["coffin"] or not ["coffee"]) subsequent to exposure to "disgusting" stimuli and a creatureliness prime. In a first study, extreme disgust-eliciting pictures (e.g., an unflushed toilet) were used. Relative to neutral pictures, higher death-thought accessibility was observed regardless of whether participants had been exposed to the creatureliness prime or not. The second study used milder disgust-eliciting stimuli (statements taken from the Disgust Sensitivity Questionnaire, Haidt et al., 1994), and in contrast to the first study, heightened death-thought accessibility occurred, but only when participants were first primed with creatureliness. This indicates that activating human creatureliness creates a condition under which even the mildest forms of disgust-eliciting situations that are encountered on a near-daily basis (e.g., using public restrooms; hearing another person sneeze, cough, or clear mucous from their throat) can increase the awareness and accessibility of death-related cognitions, and might, by extension of terror management theory, impact subsequent attitudes and behavior.

This research supports a framework in which humans have a basic underlying tendency to find their physicality and connection with other animals threatening. But individuals must also find ways to cope with it; at least for the time being, humans are relegated to live out their days in a very physical body. As articulated by terror management theory more generally, people manage the potential for terror by adopting symbolic "solutions," and this is also true with respect to attitudes and behaviors that involve the body.

THE BIRDS AND THE BEES

The body's most basic function is procreation. On one hand, sex offers the potential to literally counteract death through the creation of life. And it certainly can entail a great amount of pleasure. But, on the other hand, as Cole Porter sung, "birds do it, bees do it, even educated fleas do it" (the 1928 song, fittingly titled, "Let's Do It [Let's Fall in Love]"). To the extent that people are threatened by the recognition of the physicality of the body and its association with other animals, it follows that the physical aspects of sex may inspire some ambivalence at best, and that people may want to distance themselves from it when thoughts of their mortality are salient. This is in contrast to the more romantic aspects of the sexual experience, which should

not be threatening because romance offers meaning and symbolic value. And most, Cole Porter aside, would attribute romance as being a uniquely human experience.

The original research (Goldenberg, Pyszczynski, McCoy, Greenberg, & Solomon, 1999) addressed these reactions as a function of neuroticism. Of course, Freud first made the connection between neuroticism and inhibitions surrounding sex. From the perspective of terror management theory, the neurotic's difficulty controlling anxiety results from an inability to sustain self-esteem or faith in the validity of a meaningful worldview, and this makes their system of defense more tenuous. Thus, it can be argued that individuals high in neuroticism have exaggerated responses to mortality salience, or a sort of magnifying lens through which to view threat reactions stemming from the body.

In a first study, people were reminded of their mortality and then asked to report how appealing they found sex, including both the physical (e.g., "feeling my genitals respond sexually") and romantic (e.g., "feeling close to my partner") aspects. As predicted, reminders of mortality caused individuals high in neuroticism to report finding the physical, but not the romantic, aspects of sex less appealing. In a second study, individuals with high levels of neuroticism exhibited an increase in the accessibility of death-related thought in response to thinking about the physical aspects of sex, but not the romantic aspects. That is, not only does thinking about death make physical sex aversive for individuals high in neuroticism, but thinking about the physical aspects of sex brought thoughts of death to the surface for them.

These studies provided the first evidence of an association between sex and death, and specifically reveal that it is the physical aspects of sex that are problematic; thinking about the romantic aspects of sex was not an issue. A final study provided direct evidence that the threat associated with the physical aspects of sex is ameliorated when sex is couched in meaning. Before answering questions about the physical or the romantic aspects of sex, participants were prompted to think about love, or having a good meal (also highly pleasurable, but not a meaningful context for sex). In the good meal condition, again, individuals high in neuroticism responded with increased death accessibility when answering questions about physical (as opposed to romantic) sex. When love was prompted, however, thoughts of death no longer became more accessible in response to thinking about the physical aspects of sex.

If sex is problematic for humankind because it reminds people, or at least neurotic people, of their creaturely, mortal nature, then reminding people of the similarities between humans and animals in conjunction with mortality salience should render the physical aspects of sex threatening to everyone, not just neurotics. Goldenberg, Cox, Pyszczynski, Greenberg, and Solomon (2002) found evidence to support this in two studies. First, priming human creatureliness with the essay emphasizing human–animal similarities led to

increased accessibility of death-related thoughts after thinking about the physical, but not romantic, aspects of sex. Then, in a second study, when participants were primed with human creatureliness, mortality salience decreased attraction to the physical, but again, not the romantic aspects of sex. In each study, priming thoughts about how humans are distinct from animals eliminated the association between sex and death. This work shows that the problematic connection between sex and death is not exclusive to those with a certain pathological personality type; for all individuals, the potential for threat is there, and it is the acknowledgment of human creatureliness that underpins this association.

But sex is controversial, and it is difficult to tease apart the threat associated with the societal taboos from the threat associated with the physicality of sex. The framework offered here suggests, however, that the psychological difficulties associated with sex and the body are not solely on account of societal reactions. Rather, that there is something inherently threating about physicality in itself. In an effort to disassociate the two, Goldenberg et al. (2006) examined reactions to intensely physical experiences for which there are no taboos. In response to mortality salience priming, individuals high in neuroticism were found to flee from physical sensations, including both unpleasant and pleasurable ones. They spent less time submerging their arm in ice-cold water and using an electric foot massager; they did not, however, avoid stimulation in nontactile modalities (i.e., listening to music) in response to mortality salience, suggesting the specificity of such aversion to be limited to physical sensations. These findings help make the case that sex (and an unflushed toilet) is not only problematic because of societal taboos, but because there is a threat inherent in the physical body, perhaps explaining why the taboos exist in the first place. This work also explains (in part) why sex is shrouded in controversy and inhibition, why some people are especially sensitive to it, and the conditions that make this threat especially compelling.

THE REAL FEMALE PROBLEM

While this framework offers a general view of a psychological predicament associated with the physical body, it can also help explain why such reactions may be particularly exaggerated when women's bodies are considered, for "nature's burden falls more heavily on one sex [women]" (Paglia, 1990, p. 9). Evolutionary psychologists have long noted this inequity, highlighting the sacrifices women have to make in order to reproduce, compared to the negligible contribution males are required to make. Women are the bearers of children, carrying them in their womb for 9 months and then providing for them with lactation. When women are not pregnant and nursing, they have a menstrual cycle to remind them of their role in the propagation of the species. This is in stark contrast to the *X* minutes (depending who you ask)

required of men to complete their contribution to the task. As such, women's bodies are more blatantly committed to the reproduction of the species, and this presents a problem.

Evidence that women's reproductive functions can be threatening has been found in the domains of menstruation, pregnancy, and breastfeeding. In a study examining reactions to menstruation, male and female participants interacted with a female confederate who appeared to accidentally drop an object from her handbag. In one condition, she dropped a new, unwrapped tampon, and in the other condition she dropped a hair clip. When the confederate dropped the tampon, participants perceived her as less competent, likeable, and even increased their physical distance from her, compared to when she dropped the hair clip (Roberts, Goldenberg, Power, & Pyszczynski, 2002). Moreover, reminders of mortality have been found to exacerbate these types of responses. Cox, Goldenberg, Arndt, and Pyszczynski (2007) showed that participants primed with mortality, compared to a control, responded more negatively toward a scenario depicting a woman breastfeeding in public; death reminders also decreased liking of a potential task partner described as breastfeeding (versus bottle feeding) in another room. Further, participants given the opportunity to set up chairs in order to engage in a "getting acquainted exercise" with the purported breastfeeding task partner placed their chairs farther apart after being reminded of their mortality compared to a control.

Supporting the hypothesis that such reactions are rooted in threats associated with human creatureliness, priming mortality and breastfeeding increased cognitions associated with human creatureliness (using an adapted word completion task meant to tap into thoughts of creatureliness, e.g., *creature; physical*; based on the death ideation task described earlier). Furthermore, priming human/animal similarities increased negative reactions to a magazine cover depicting a woman breastfeeding (Cox, Goldenberg, Arndt, et al., 2007). This latter study took advantage of two nearly identical magazine covers, with one showing actor Pierce Bronson with his wife and child, and the other showing the same pose except with his wife breastfeeding, to demonstrate the effect.

Similar negative reactions have also been found to increase in response to portrayals of pregnant women following creatureliness primes. For example, participants were presented with a magazine cover showing actress Demi Moore either pregnant, or a similar cover in which she was not pregnant (Goldenberg, Goplen, Cox, & Arndt, 2007). Participants found the pregnant image of her to be more offensive compared to the nonpregnant picture, but only after a creatureliness prime. In the second study, participants were presented with pregnant or not pregnant pictures of Gwyneth Paltrow. Participants presented with the pregnant Gwyneth Paltrow found her to be less competent, compared to the nonpregnant image, but again, only after a creatureliness prime. Together, these studies depict that reminders of female

reproduction negatively impact how women are perceived, and that such negative perceptions are rooted in the desire to draw a line in the sand between animals and humans.

Not only this, but evolution has also assured that men are attracted to the same bodies (and many of these same body parts) that offer blatant reminders of human creatureliness. It follows that mortality reminders should complicate this attraction, by making it threatening. Landau et al. (2006) found evidence of this: mortality reminders reduced heterosexual men's self-reported attraction to a sexually alluring woman, however comparable effects did not occur for heterosexual women's attraction to a sexually seductive man. Additionally, men's attraction in itself was shown to be instrumental in making violence toward woman more socially acceptable (presumably as a way to ameliorate the threat associated with the female body). In this study, men were asked to think about a time when they had experienced lust toward a woman (compared to excitement in response to a sporting event meant to serve as a control); those reminded of their mortality recommended more lenient penalties to a male who had aggressed against a woman, but not to a male who had aggressed against another man. These findings suggest that the unique threat of women's bodies, and men's attraction to them, may interact in a way that creates a perfect storm.

OBJECTIFICATION AS TERROR MANAGEMENT

Building on the terror management framework, Goldenberg and Roberts (2004, 2011) first speculated that, in the same way concerns surrounding physical death are managed symbolically, though investment in a meaningful cultural worldview, the threat associated with women's bodies is managed by transforming the physical body into a cultural symbol. That is, in order to compensate for the threat aroused by women's bleeding, lactating, and pregnant bodies, and men's attraction to them, women are stripped of these threatening associations and held to high standards of beauty and perfection.

The first evidence for objectification as compensation for women's bodily creatureliness was obtained from Roberts et al.'s (2002) tampon-drop study. In it, the woman who dropped the tampon was not only viewed more negatively, but participants exposed to the tampon subsequently reported thinking that it was more important for a woman's body to be beautiful (relative to competent), compared to participants who witnessed the dropping of a hair clip—an item that might actually be expected to focus attention on appearance. Other research has also shown that mortality primes increase the importance placed on women's appearance (Grabe, Routledge, Cook, Andersen, & Arndt, 2005), providing further support for the role that objectification may play in assuaging the threat associated with the female body.

But certainly, the emphasis on, and expectations for, women's appearance does not directly eliminate the threat of impending death. Why, then, would

such a response be desirable when confronted with mortality? As Goldenberg (2013) hypothesized, stripping women of the natural aspects of their body (through appearance norms) not only makes them more appealing to look at, but quite literally transforms the body into an object. In this way, "literal objectification"—i.e., seeing and treating a person (or oneself) less like a human being and more like an object—makes sense as a defense against the awareness of mortality because objects are not subject to the certain fate of mere mortals.

Morris, Goldenberg, and Heflick (2014) tested this idea empirically by priming participants with thoughts of death and a reminder of female reproduction. In a first study, when a mortality prime was coupled with an image of a pregnant woman whose belly was exposed (vs parallel control conditions), women responded by placing more value on their body's appearance, relative to its competence—i.e., they self-objectified (as it is typically operationalized). Additionally, these women also denied themselves of traits considered essential to human nature, effectively viewing themselves in terms more consistent with how one views objects, rather than humans (see Haslam, 2006). Such responses were not observed among male participants. In a second study, when women were reminded of death, relative to a control, and asked by a female experimenter if they had a tampon (vs a pencil) to spare, they did not respond with increased appearance emphasis; they did, however, deny themselves of traits essential to human nature, again replicating the "literal objectification" effect. These results suggested that although appearance striving might be an effective means to manage the threat of death in some circumstances (perhaps in response to pregnancy, when the corporeality of the body is manifested in visible changes to appearance), literal (self) objectification offers a broader psychological protective function. Providing further evidence for the utility of literal self-objectification, women responded to a mortality and breastfeeding prime by explicitly associating themselves with objects (as measured by a categorization task), which in turn, reduced the amount of time they spent writing about death.

As discussed earlier, one paradoxical point from this research is that, in spite of the threat inherent in women's natural, reproducing bodies, men are attracted to them. How can one reconcile being attracted to, and simultaneously threatened by, women's bodies? Again, literal objectification offers a solution to this problem—by transforming women's natural bodies into objects, they become more desirable. Building on the research by Landau et al. (2006), Morris and Goldenberg (2015) assessed whether the literal objectification of a woman's (sexual) body might reduce the threat associated with it when death was made salient. Participants were primed with mortality (or a control) and presented with a product advertisement featuring a sexualized woman (e.g., a *Budweiser* beer model) either merged with a literal object (i.e., as if she were the label on the beer bottle), or separate from the object (i.e., the same woman next to the beer bottle). Replicating the

results of Landau et al. (2006), heterosexual men primed with death found the sexualized woman less attractive if she was presented as separate from the object. Literal objectification not only reduced, but completely reversed this effect: in response to a mortality prime, men reported that the same woman merged with the beer bottle was *more* attractive, compared to men in the control condition.

Although men's attraction to women is problematic in the attempt to keep the awareness of mortality at bay, literal objectification of the female body may help to reconcile this dual threat/attraction motive. These findings might also explain, in part, why depictions of objectified women dominate mainstream media and advertising. Women are routinely sexualized, portrayed with only parts of their body showing (e.g., a Tom Ford ad of a cologne bottle held between a woman's breasts), or even depicted as a type of "stand in" for actual objects (e.g., a magazine spread showing nude women posed as tables and chairs, with handbags, shoes, and sunglasses placed on their backs and hung from their limbs). Though it might otherwise be disturbing to see a person treated as if they were an inanimate object, such depictions might strike the right balance for men by tapping into their attraction toward women (after all, "sex sells"), but circumventing the potential threat associated with (real) women's bodies.

A SPECIMEN OF HEALTH

One very practical implication of this framework concerns the application to outcomes relevant for physical health. The terror management health model (Goldenberg & Arndt, 2008; Chapter 17: Aging and Coping With Mortality: Understanding Attitudes About Aging and Age-Related Differences in Coping With Death) in particular highlights a previously unrecognized barrier in cancer screening. Breast self-exams, for example, may pose a threat due to the potential salience of the physicality of the procedure (i.e., kneading through breasts) in a context when mortality concerns are likely to be activated (i.e., detection of cancer; Arndt, Cook, Goldenberg, & Cox, 2007). Thus, when such concerns are activated, individuals may be particularly apt to put their health at risk by avoiding the behavior.

In experimental research, women reminded of their creatureliness and also primed with death reported reduced intentions to perform breast self-exams (Goldenberg, Arndt, Hart, & Routledge, 2008). Notably, this was not accounted for by worry about breast cancer, suggesting that it is the exam itself, and not the outcome of what one might find, that poses a threat. Moreover, to the extent that screening behavior can increase concerns about death, priming creatureliness should decrease breast exam behavior in the absence of an explicit reminder of mortality. In a second experiment, female participants approximated the experience of an actual breast exam, by conducting an exam on a realistic breast model (an experience which produced an

increase in death-thought accessibility in pilot testing). After reading the essay describing human creatureliness, human uniqueness, or a control (no essay), female participants were instructed to conduct the exam on the breast model; the amount of time spent on the exam was measured with a concealed video camera. Shorter exam times were observed among women receiving the creaturely essay, relative to both the human uniqueness and no-essay condition.

A final study extended these findings by examining discomfort as a potential mechanism for the effects, using participants with a greater risk of cancer (community members, age 35 and up), and having them conduct a breast exam on their own breasts. To test the hypothesis that reminders of one's physicality increases distress experiences when faced with a breast self-exam, and that this distress undermines the behavior, the study included a classic misattribution of arousal manipulation (e.g., Zanna & Cooper, 1974). Before performing the breast self-exam, participants were led to believe that they were sampling a water product that contained herbal additives with energizing (or calming) properties and that some people have reported a feeling of slight nervousness (or drowsiness) after having consumed it. According to the current analysis, being primed with creatureliness should increase discomfort from the exam and thus decrease exam duration, unless a feasible alternative explanation was provided for participants' discomfort (i.e., increased arousal due to the "energizing drink"). As predicted, after the creatureliness essay, participants spent less time in a private room where they conducted the breast self-exam when there was no alternative explanation for their discomfort ("calming water" condition) compared to when they drank "energy water," and had a reasonable alternative source to misattribute their discomfort. Thus, presumably the discomfort aroused by the breast self-exam resulted from the salience of human creatureliness, which in turn inhibited this beneficial health behavior for at-risk women.

This same framework has also been applied to mammography (Goldenberg, Routledge, & Arndt, 2009), a procedure considered more important for cancer detection than breast self-exams. In a study with female college participants having no family history of breast cancer, participants read about a mammogram and reported their willingness to vicariously experience one. Creatureliness and mortality salience were manipulated, and dispositional differences in neuroticism were also measured, on account of prior research described earlier (e.g., Goldenberg et al., 1999). The results showed that when concerns about mortality were salient, creatureliness priming led participants who were high in neuroticism to report a reduced willingness to undergo a mammogram (but not a tax audit, in a parallel study). This study was then followed up with one in which women actually received a mammogram at a cancer clinic. Prior to receiving their mammogram, participants completed a measure of neuroticism and were exposed to the creaturely manipulation. Subsequent to the mammogram—a situation in which concerns of mortality are likely activated—participants high in neuroticism reported increased

perceptions of physical and psychological discomfort if they were first given the creaturely prime.

Taken together, this research suggests that threats to the self can undermine health behaviors involving confrontations with the physical body. A question that remains is whether the knowledge garnered from this research can be harnessed to counteract defensive reactions to, and avoidance of, critically important health behaviors. Integrating insights from self-affirmation theory (Steele, 1988), Morris, Cooper, Goldenberg, Arndt, and Routledge (2013) investigated whether affirming the self might allow for engagement with behaviors that would otherwise be distanced from (i.e., breast self-exams) by reducing defensive processing of existential threat. Moreover, this study employed a novel manipulation of self-affirmation building from research showing that exposure to objectifying stimuli can be self-affirming for women who highly value their appearance (Goldenberg, Cooper, Heflick, Routledge, & Arndt, 2011). Participants were given a health message priming the association between breast cancer and death and then shown a magazine cover either depicting a woman as objectified (i.e., *Sports Illustrated* swimsuit issue) or not (i.e., *Sports Illustrated* cover featuring soccer star Mia Hamm). The combination of the death reminder and objectifying image increased women's intentions to engage in breast self-exams, and promoted more positive reactions to a brochure describing breast self-exams. Critically, though, this was only the case for women who placed strong emphasis on their physical appearance (i.e., high self-objectifiers), suggesting that it was the self-affirming aspect of the objectifying stimuli that offered psychological protection from the threatening health behavior.

A broader implication of this work comes from the insights derived from research on the terror management function of literal (self) objectification. Though appearance-oriented objectification can be self-affirming, and this can reduce defensive processing around threatening health behaviors, literal objectification might provide an even more effective route to manage concerns associated with the physical body, and health behaviors that require direct confrontation with it. That is, to the extent mortality salience prompts women to view their bodies more like objects, such a perception may allow for disengagement from the threatening, creaturely aspects of the body, allowing for the physical interaction with it necessary to effectively undertake screening behaviors such as breast self-exams. Such a hypothesis remains to be tested, but underscores why specifying the fundamental processes underlying terror management is critical in the aim of promoting and changing health behaviors.

AN ALTERNATIVE TO TERROR MANAGEMENT

The problem that the human body poses in the management of existential concerns has been described as being quelled, thus far, through a variety of suboptimal methods with respect to one's physical (e.g., avoiding health

behaviors) and mental health (e.g., objectification and sexual inhibition). Further, research examining the deficits that neurotic individuals have in their ability to successfully manage the anxiety arising from the creaturely aspects of the human body (manifested through heightened levels of disgust with bodily functions), at face value, paints an even dimmer picture of how certain types are prone to such troublesome outcomes. But, are human beings inevitably doomed to have a problematic relationship with their own bodies and those of others?

Recent research conducted on the moderating role of trait level openness to experience in the management of existential anxieties might offer a more optimistic outlook. This work reveals that individuals high in this personality trait do not manifest typical reactions of worldview defense and self-esteem striving following reminders of mortality; i.e., they do not seem to treat death as a threat that needs to be guarded against (Boyd, Goldenberg, & Morris, 2017). By extension, high openness may also alleviate the need to respond defensively to reminders of the corporeality of the human body. Evidence that people high in openness tend to be low in disgust sensitivity is consistent with this thesis (Druschel & Sherman, 1999). In addition, Moyano and Sierra (2013) observed a positive relationship between openness to experience and a number of positive sexual cognitions. Although the research on openness relies on individual differences that are thought to be relatively immutable (but see, Schutte, Malouff, Segrera, Wolf, & Rodgers, 2003), just like neuroticism, we view it as a magnifying lens through which nondefensive mind-sets can be examined with respect to existential concerns. People high in openness approach novel situations with curiosity (Kashdan et al., 2009) and interest (Silvia & Sanders, 2010), and are more likely to have experiences of awe (Silvia, Fayn, Nusbaum, & Beaty, 2015). Not surprisingly, interest and curiosity are provoked from thinking about death, and also function to decrease defensiveness among individuals high in openness (Boyd et al., 2017). Despite its grotesqueness, the body—in its intricacies, incredible efficiencies, and most notably, life creating abilities—is infinitely interesting and awe-inspiring. It seems then, that highlighting the body's association with life may promote interest, curiosity, and awe, perhaps reconciling people's complicated relationship with it. For "birds do it, bees do it," and "educated fleas," at least if they are open, may even stand to reap existential reward inherent in human corporeality.

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Chapter 10

An Attachment Perspective on Managing Death Concerns

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Attachment theory (e.g., Bowlby, 1973, 1979, 1980, 1982, 1988), which concerns the effects of experiences in close relationships on well-being, mental health, and psychosocial functioning, provides a conceptually rich, research-generating framework for the study of emotional regulation, in general, and management of fears and anxieties, in particular. In this chapter I, apply the theory to understand the ways in which people experience and cope with the existential concern of one's own mortality. The main argument here is that attachment security—a felt sense, rooted in one's history of close relationships, that the world is generally safe, other people are generally helpful when called upon, and I, as a unique individual, am valuable and lovable, thanks to being valued and loved by others—provides a psychological foundation for easing existential anxieties and constructively managing the terror of death.

I begin this chapter by presenting an overview of attachment theory and Mikulincer and Shaver's (2016) theoretical model of the activation and psychodynamics of the attachment behavioral system in adulthood. I then apply this model to explain the ways people attempt to manage the terror of their own mortality. Specifically, I will show, based on empirical studies, that a heightened awareness of death automatically activates what Bowlby (1973) called the attachment system. This in turn motivates what he called "proximity seeking"—moving toward actual others or mental representations of them to bolster feelings of safety and security and thereby reduce existential anxiety. I then review studies showing that individual differences in attachment-system functioning shape the ways in which people experience, think about, and cope with the terror of death.

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OVERVIEW OF ADULT ATTACHMENT THEORY

The main construct in Bowlby's (1982) attachment theory is the *attachment behavioral system*, an innate psychobiological system that motivates people to seek proximity to supportive others (*attachment figures*) in times of need. Although the attachment system is most crucial in the early years of life, because of human infants' extreme immaturity and dependence on others, Bowlby (1988) claimed that it is active throughout life and is manifested in thoughts and behaviors related to proximity- and support-seeking and in the resulting sense of security. This idea has now been bolstered by neuropsychological research (summarized by Coan, 2016) indicating that the human brain evolved to function within the context of social relationships and that reliance on others is the default strategy for emotion regulation.

According to Bowlby (1973), although all human beings are born with a capacity to seek proximity, security, and help with the regulation of negative emotions in times of need, meaningful individual variations arise in close relationships that affect psychological and social functioning. When attachment figures are reliably available when needed, are sensitive to one's attachment needs, and respond positively to one's bids for proximity and support, a person feels generally secure and efficacious and can develop positive expectations about others' availability and responsiveness, which Bowlby (1973) called *internal working models of self and others*. This emerging sense of security allows people to explore the physical and social environment curiously, learn diverse skills, develop cognitively and emotionally, and enjoy life's challenges with the confidence that an attachment figure will be available and responsive when needed (what Bowlby, 1988; called the secure-base function of attachment figures). Moreover, people who have been treated well by attachment figures learn that threats are temporary, problems are solvable, and obstacles can be overcome. As a result, they can maintain an optimistic stance during stressful and traumatic events and to deploy more constructive and effective strategies for managing distress and other negative emotions (Mikulincer & Shaver, 2016).

A history of security-enhancing interactions with attachment figures also results in the formation of what attachment researchers (e.g., Mikulincer, Shaver, Sapir-Lavid, & Avihou-Kanza, 2009; Waters & Waters, 2006) call a "secure-base script," which goes something like this: *When I encounter difficulties, I can call on my attachment figure for comfort and support, and I will then feel better and go back to other activities with a renewed sense of confidence*. Having many experiences that contribute to the construction of this script makes it easier for a person to confront stressful situations with optimistic expectations, which in turn helps him or her maintain relative calm and optimistic hope while coping with problems.

However, when attachment figures are not reliably available and supportive, a sense of safety and security is not restored, doubts about one's lovability and

worries about others' motives and intentions are formed, and strategies of affect regulation other than confident proximity seeking and effective self-regulation are adopted. In this case, the primary strategy of the system—proximity seeking—repeatedly fails to attain security ("When I try to rely on others, they prove to be either unreliable or outright punishing"), and people will increasingly adopt what Main (1990) called *secondary strategies*. These strategies include being either overly worried, vigilant, and demanding (i.e., anxiously attached) or emotionally self-restrained, self-reliant, and intimacy avoidant (i.e., avoidantly attached).

In studies of adolescents and adults, tests of these propositions from attachment theory have focused on a person's *attachment orientation*—the systematic pattern of relational expectations, emotions, and behavior that results from a particular history of attachment experiences (Fraley & Shaver, 2000). Beginning with Ainsworth, Blehar, Waters, and Wall's (1978) studies of infant attachment, and followed by hundreds of adult attachment studies, researchers have found that attachment orientations can be measured along two orthogonal dimensions of attachment-related *anxiety* and *avoidance* (Brennan, Clark, & Shaver, 1998). Attachment *anxiety* reflects the degree to which a person worries that relationship partners will not be available in times of need and is afraid of being rejected or abandoned. Attachment-related *avoidance* reflects the extent to which a person distrusts relationship partners' goodwill and strives to maintain independence and emotional distance from partners. People who score low on both dimensions are said to be secure, or secure with respect to attachment. The two dimensions can be measured with reliable and valid self-report scales (e.g., Brennan et al., 1998) and are associated in theoretically predictable ways with many aspects of personal well-being and relationship quality (see Mikulincer & Shaver, 2016, for a review).

Although attachment orientations are initially formed during childhood in relationships with parents and other early caregivers (Cassidy & Shaver, 2016), Bowlby (1988) believed that important interactions with relationship partners beyond childhood can alter a person's working models and move him or her from one region of the two-dimensional anxiety-by-avoidance space to another. Moreover, although self-report scales can measure a single global orientation toward relationships, such an orientation is an emergent property of a complex network of cognitive and affective processes, which include many episodic, context-relative, and relationship-specific memories and schemas (Bowlby, 1988; Mikulincer & Shaver, 2003). Many studies indicate that a person's attachment orientation can change depending on context and recent experiences (Mikulincer & Shaver, 2007), making it possible to study the causal effects of an experimentally primed sense of security within the confines of a social psychological laboratory or to examine the long-term effects of real-life security-enhancing interpersonal, group, and organizational contexts.

A person's location in the two-dimensional anxiety-by-avoidance space reflects both the person's sense of attachment security and the ways in which he or she deals with threats and stressors (Mikulincer & Shaver, 2016). People who score low on these dimensions are generally secure and tend to employ constructive and effective affect-regulation strategies. In contrast, people who score high on either attachment anxiety or avoidance, or both (a condition called fearful avoidance), suffer from attachment insecurities. Insecure people tend to use secondary attachment strategies that we, following Cassidy and Kobak (1988), characterize as "hyperactivating" or "deactivating" the attachment behavioral system in an effort to cope with threats.

People who score high on attachment anxiety rely on hyperactivating strategies—energetic attempts to achieve proximity, support, and love combined with lack of confidence that these resources will be provided and with feelings of sadness or anger when they are in fact not provided. These reactions occur in relationships in which an attachment figure is sometimes responsive but unreliably, placing the needy person on a partial reinforcement schedule that rewards exaggeration and persistence in proximity-seeking attempts because these efforts sometimes succeed (Ainsworth et al., 1978). In contrast, people who score high on avoidant attachment tend to use deactivating strategies: trying not to seek proximity to others when threatened, denying attachment needs, and avoiding closeness and interdependence in relationships. These strategies develop in relationships with attachment figures who disapprove of and punish bids for closeness and expressions of need (Ainsworth et al., 1978).

In short, each attachment orientation has a major regulatory goal (insisting on proximity to an attachment figure or on self-reliance), which goes along with particular cognitive and affective processes and deployment of specific strategies for managing insecurities, worries, and distress. These strategies affect the formation and maintenance of close relationships as well as the experience, regulation, and expression of negative emotions, such anxiety, anger, or sadness (Mikulincer & Shaver, 2016). Moreover, the strategies affect the ways in which people experience and cope with threatening events, including the terror of one's own mortality.

DEATH AWARENESS AS A TRIGGER OF ATTACHMENT-SYSTEM ACTIVATION

According to attachment theory, the attachment system was "designed," or selected, by evolution as a regulatory device for dealing with all kinds of threats, including existential concerns about annihilation or death, which Bowlby (1982) discussed in relation to the threat of predation in early humans' environment of adaptation. As a result, real or symbolic threats to a person's sense of continued existence (including making his or her mortality salient) can automatically drive him or her to seek proximity to a

security-enhancing figure or activate inner representations of security providers, and then obtain protection and comfort and restore felt security (Mikulincer & Shaver, 2016). This means that a sense of attachment security can be an effective terror management mechanism that restores a person's sense of value and continuity, rendering other symbolic defenses less necessary. In contrast, lack of available, responsive, and sensitive attachment figures may cause people to rely on other forms of defense against death anxiety, including cultural worldview validation and self-esteem enhancement.

In an early study of the mental accessibility of security-enhancing representations, Mikulincer, Birnbaum, Woddis, and Nachmias (2000, Study 3) found that preconscious reminders of death can automatically activate the attachment system. Participants were subliminally exposed to the word "death" or a neutral word for 22 ms in each of several trials and then they were asked to decide whether a string of letters was a word or not (lexical decision task). These strings included words related to attachment security (e.g., love, hug, closeness), attachment-unrelated positive words, neutral words, and non-words. Findings indicated that the death prime, compared to the neutral prime, increased the mental availability of words related to attachment security (as indicated by faster reaction times in the lexical decision task). The word "death" had no effect on the mental availability of attachment-unrelated positive or neutral words.

There is also evidence that conscious death reminders drive people to seek proximity to a close other. For example, in a series of three experimental studies, Taubman-Ben-Ari, Findler, and Mikulincer (2002) examined the impact of death reminders on a person's relational strivings and beliefs. In the first study, Taubman-Ben-Ari, Findler, and Mikulincer (2002) assigned participants to mortality salience or neutral conditions, and, after a delay task, asked them to rate their willingness to initiate a variety of social interactions with a hypothetical same-sex target (e.g., asking him or her to study together for an exam). In line with the attachment-system activation hypothesis, a mortality salience induction led participants to report higher willingness to initiate social interactions than a neutral condition. In the next two studies, Taubman-Ben-Ari et al. (2002) focused on cognitive factors that have been found to facilitate the formation of close relationships—confidence on one's interpersonal skills and competences (Buhrmester, Furman, Wittenberg, & Reis, 1988)—or to inhibit the formation of these relationships—rejection sensitivity (e.g., Downey & Feldman, 1996; Downey, Lebolt, Rincon, & Freitas, 1998). Findings clearly indicated that death awareness biased cognitive judgments and expectations in ways that favor proximity-seeking and maintenance. Specifically, making mortality salient, as compared to a neutral condition, led to higher appraisals of interpersonal competences for initiating relationships, disclosing personal information, and making assertive statements to a relationship partner as well as to reduced expectations of being rejected by such a partner. Taken as a whole, these findings imply that mortality salience

promotes a positive motivational and cognitive orientation toward social interactions and interpersonal relationships.

In two subsequent studies, Mikulincer, Florian, and Hirschberger (2004) examined the effects of mortality salience on a person's attitudes toward romantic relationships. In the first study, they focused on Lee's (1977) styles of romantic love and examined the impact of mortality salience on a person's preference for different love styles. Findings indicated that death reminders, as compared to a neutral condition, heightened preference for love styles that can maintain and enhance the quality and stability of romantic relationships (i.e., eros and agape styles). In the second study, they examined the hypothesis that exposure to death reminders would lead people to prefer romantic partners whose love styles can facilitate the maintenance of a satisfactory relationship and to reject partners whose love styles have negative consequences for relationship quality. Findings were consistent with the prediction: As compared to a physical pain condition, making mortality salience heightened preference for partners who held eros or agape styles—the two styles that contribute to the formation of stable and satisfactory relationships—and lowered preference for partners who held a ludus style—a style that can endanger the stability of romantic bonds.

Two additional studies have provided further support to the hypothesis that death reminders increase a person's strivings for intimate and committed romantic bonds. In one study, Mikulincer and Florian (2000, Study 5) examined the effects of mortality salience on a person's desire for romantic intimacy. Specifically, participants were randomly assigned to a mortality salience or neutral condition, and, after a distracting task, they completed Sharabany's (1994) intimacy scale tapping the level of intimacy they ideally wanted to have with a romantic partner. As compared to a neutral condition, making mortality salience led to higher reports of desire for intimacy in romantic bonds.

In another study, Florian, Mikulincer, and Hirschberger (2002, Study 1) examined the effects of mortality salience on the sense of commitment in romantic relationships. Specifically, participants were asked to write about either their own death or a neutral topic (watching TV). Following a distracter task, all participants then rated the extent to which they were committed to their romantic partner (e.g., "I am completely devoted to my partner") as well as their moral commitment to marriage (e.g., "Marriages are supposed to last forever"). Participants in the mortality salience condition reported greater psychological commitment to their romantic partner than participants in the neutral condition. However, there was no significant effect of mortality salience on moral commitment. Florian et al. (2002) concluded that death reminders increase the sense of love and closeness to a romantic partner but not marriage-related moral duties.

It is important to note that the above reviewed findings do not necessarily mean that the attachment system becomes activated by death reminders. In

fact, proximity seeking can serve purposes other than protection and security, such as encouraging sexual intercourse and hence reproduction. To demonstrate attachment-system activation, it is necessary to show that proximity seeking serves a protective function. This demonstration can be accomplished in two ways. First, if felt security buffers a person from the terror of death awareness, seeking proximity to a security-enhancing figure following mortality salience should reduce the need for other terror management defenses, such as cultural worldview validation or self-esteem enhancement. Second, if felt security shields people from death anxiety, interference with proximity seeking to a security-enhancing figure should increase concerns about death.

In two studies, Florian et al. (2002) provided evidence for the protective function of felt security following mortality salience. In one study (Florian et al., 2002, Study 2), people were randomly assigned to a mortality salience or a neutral condition and then randomly divided into two subgroups based on a manipulation of romantic commitment. Participants in the commitment condition were asked to describe emotions associated with committing themselves to a romantic partner. Participants in the no commitment condition were asked similar questions about a neutral topic (listening to the radio). All of them then rated the severity of punishment that was appropriate for various social transgressions, which was meant to assess a common worldview defense—punishing people who transgress social norms (Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). The results showed that mortality salience (as compared with the neutral condition) increased participants' harsh judgments of purported social transgressions in the no commitment condition, but it had no effect on punishment severity when romantic commitment had been made salient. That is, asking people to think about their romantic commitment reduced the need to use other defenses against the threat of death.

In another study (Florian et al., 2002, Study 3), participants were randomly divided into three conditions according to the kinds of thoughts that were made salient (problems in a romantic relationship, academic problems, neutral topics). All participants then completed Greenberg, Pyszczynski, Solomon, Simon, and Breus's (1994) word-completion task, which measures the implicit accessibility of death-related thoughts. Findings showed that participants in the "problems in romantic relationship" condition produced more death-related words than participants in the "academic problems" and neutral conditions. Thus, thinking about difficulties in close relationships heightens death-thought accessibility.

There is also evidence that proximity seeking to security-enhancing figures and the resulting sense of security can override the need for other defenses against death awareness. Hirschberger, Florian, and Mikulincer (2003) asked whether death awareness can still drive people to seek proximity to a relationship partner even when this partner's complaints or criticisms

can threaten their self-esteem. Participants were assigned to a mortality salience or a control condition and were asked to imagine having dinner at their partner's parents' home and then receiving one of three kinds of evaluations from their partner—either admiration ("I'm very proud of you. You were so friendly and nice tonight"), a complaint ("Tonight you seemed to be really withdrawn, and you didn't even offer to help my mother"), or a criticism ("As usual, you were totally self-absorbed all evening and didn't help my mother. You are an egotist! What kind of a person are you?"). They were then asked to rate their willingness to engage in emotionally intimate interactions with their partner.

Participants who had been exposed to a mortality salience induction were more interested in emotional intimacy than participants in the neutral condition. Moreover, whereas in the neutral condition a partner's admiration led to a stronger desire for intimacy than a partner's complaint or criticism, this difference was not significant in the mortality salience condition. In fact, death reminders increased the desire for emotional intimacy even after a partner complained or criticized, implying that death awareness makes people willing to pay the price of diminished self-esteem to maintain emotional closeness with a romantic partner. This conclusion is reinforced by Wisman and Koole's (2003) observation that death reminders heightened preference for sitting close to other people in a group discussion, rather than sitting alone, even if this seating preference required exposing one's worldviews to potential attack (participants knew that other participants would disagree with their beliefs).

Overall, findings from these studies indicate that felt security is a shield against existential threats and makes people less inclined to try to validate their beliefs or enhance their self-esteem following death reminders. Reliance on worldview defenses or self-esteem inflation may be more probable when proximity seeking fails to restore security and then to accomplish its protective function. And, as we discuss in the next section, these defenses may be typical of insecurely attached people who hold chronic worries about others' availability and responsiveness and their own lovability and worth.

ATTACHMENT-RELATED DIFFERENCES IN MANAGING DEATH ANXIETY

According to Mikulincer and Shaver (2016), individual differences in attachment orientations along the anxiety and avoidance dimensions are directly manifested in the way people regulate distress and other negative emotions. When regulating their emotions, people scoring high on avoidant attachment attempt to block or inhibit any emotional state that is incongruent with the goal of keeping their attachment system deactivated (Mikulincer & Shaver, 2016). These inhibitory efforts are directed mainly at fear, anxiety, anger, sadness, shame, guilt, and distress, because these emotions are associated

with threats and feelings of vulnerability. In addition, anger often implies emotional involvement or investment in a relationship, and such involvement is incongruent with avoidant people's preference for independence and self-reliance (Cassidy, 1994). Avoidant individuals also attempt to block or inhibit emotional reactions to potential or actual threats to attachment-figure availability (rejection, betrayal, separation, loss), because such threats are direct triggers of attachment-system activation. Like secure people, avoidant ones attempt to downregulate distress. But secure people's regulatory attempts usually promote communication, compromise, and relationship maintenance, whereas avoidant people's efforts are aimed mainly at keeping the attachment system deactivated, regardless of the deleterious effects this can have on a relationship.

Deactivating strategies cause people to avoid noticing their own emotional reactions. Avoidant individuals often deny or suppress emotion-related thoughts and memories, divert attention from emotion-related material, suppress emotion-related action tendencies, or inhibit or mask verbal and nonverbal expressions of emotion (Mikulincer & Shaver, 2016). By averting the conscious experience and expression of unpleasant emotions, avoidant individuals make it less likely that emotional experiences will be integrated into their cognitive structures and that such feelings and mental structures will be used effectively in information processing and social behavior. Bowlby (1980) described this strategy as "defensive exclusion" and the creation of "segregated mental systems."

Unlike secure and avoidant people, who tend to view negative emotions as goal-incongruent states that should either be managed effectively or suppressed, anxiously attached individuals tend to perceive these emotions as congruent with attachment goals, and they may seek to sustain and even exaggerate them. Attachment-anxious people are guided by an unfulfilled wish to cause attachment figures to pay more attention and provide more reliable protection and support (Cassidy & Kobak, 1988; Mikulincer & Shaver, 2016). Therefore, they tend to exaggerate the presence and seriousness of threats and to overemphasize their sense of helplessness and vulnerability, because signs of weakness and neediness can sometimes elicit attachment figures' attention and care (Cassidy & Berlin, 1994).

How is anxious hyperactivation sustained? One method is to exaggerate the appraisal process, perceptually heightening the threatening aspects of even fairly benign events, hold pessimistic beliefs about one's ability to manage distress, and attribute threat-related events to uncontrollable causes or global personal inadequacies (Mikulincer & Shaver, 2016). Another method is to attend to internal indicators of distress (Cassidy & Kobak, 1988). This includes hypervigilant attention to the physiological aspects of emotional states, heightened recall of threat-related experiences, and rumination on real and potential threats (Shaver & Mikulincer, 2014). Another hyperactivating strategy is to intensify negative emotions by favoring an approach, counter-phobic orientation toward

threatening situations or making self-defeating decisions and taking ineffective actions that are likely to end in failure. All of these strategies create a self-amplifying cycle of distress even after a threat objectively recedes.

There is extensive evidence that these attachment-related differences in emotion regulation are manifested in the experience and management of death anxiety. For example, a number of studies conducted in my laboratory focused on attachment-style differences in the strength of death anxiety, assessed in terms of overt fear of death (Florian & Mikulincer, 1998; Mikulincer, Florian, & Tolmacz, 1990), unconscious expressions of this fear (responses to projective thematic apperception test cards; Mikulincer et al., 1990), or the accessibility of death-related thoughts (the number of death-related words produced in a word-completion task; Mikulincer & Florian, 2000; Mikulincer, Florian, Birnbaum, & Malishkevich, 2002). Findings consistently indicated that people scoring relatively high on attachment anxiety tend to intensify death concerns and thoughts. Specifically, attachment anxiety is associated with heightened fear of death at both conscious and unconscious levels, as well as heightened accessibility of death-related thoughts, even when no death reminder is present. In contrast, people scoring relatively high on avoidant attachment tend to suppress overt death concerns and exhibit dissociation between their conscious reports and unconscious indexes of death anxiety. Avoidance is related to both low levels of self-reported fear of death and heightened death-related anxiety assessed with a projective measure.

Attachment-related differences have also been found in people's construal of death anxiety (Florian & Mikulincer, 1998; Mikulincer et al., 1990). Anxiously attached people tend to attribute this fear to the loss of social identity after death (e.g., "People will forget me"), whereas avoidant people tend to attribute it to the unknown nature of the hereafter (e.g., "uncertainty about what to expect"). On the one hand, people scoring relatively high on attachment anxiety tend to hyperactivate worries about rejection and abandonment, viewing death as yet another relational setting in which they can be abandoned or forgotten. On the another hand, people scoring relatively high on avoidant attachment work to sustain self-reliance and strong personal control and then fear mainly the uncertain and unknown aspects of death which can threaten their sense of control.

A related line of research examined attachment-related differences in the way people manage anxiety aroused by death reminders. According to terror management theory (e.g., Pyszczynski, Sullivan, & Greenberg, 2015), human beings' knowledge that they are destined to die, coexisting with strong wishes to perceive themselves as special, important, and immortal, makes it necessary for them to engage in self-promotion, defend their cultural worldviews, and deny their animal nature. Many studies have shown that experimentally induced death reminders lead to more negative reactions to the human body, moral (i.e., worldview) transgressors, and members of out-groups (see Pyszczynski et al., 2015, for a review).

Although worldview validation has been assumed to be a normative defense against universal existential threats (Pyszczynski et al., 2015), this response is more characteristic of insecure than of secure people. For example, experimentally induced death reminders produced more severe judgments and punishments of moral transgressors, greater willingness to die for a cause, and more support for a conservative president candidate only among insecurely attached people, either anxious or avoidant (Caspi-Berkowitz, 2003; Mikulincer & Florian, 2000; Weise et al., 2008). Securely attached people were less affected by death reminders. Moreover, the experimental priming of attachment security buffered the effects of mortality salience on increased support for violent measures against terrorists (Weise et al., 2008) and increased support for the war in Iraq and harsh foreign policy toward North Korea (Gillath & Hart, 2010).

Other studies also found that insecurely attached people reacted to mortality salience with increased adherence to culturally consensual beliefs about romantic bonds (Smith & Massey, 2012) and a heightened self-enhancing tendency of naming their children after themselves (Vicary, 2011). Moreover, Anglin (2014) reported that people scoring relatively high on both anxiety and avoidance dimensions reacted to death reminders with an exacerbation of their habitual relational ambivalence—heightened strivings to repair troubled relationships and lowered expectations for improving such relationships.

Some of the studies reveal ways in which more secure people react to death reminders. Mikulincer and Florian (2000) found that secure people reacted to mortality salience with an increased sense of symbolic immortality—a constructive, transformational strategy that, while not solving the unsolvable problem of death, leads people to invest in their children's care and to engage in creative, growth-oriented activities whose products live on after death. Secure people also reacted to mortality salience with heightened attachment needs—a more intense desire for intimacy in close relationships (Mikulincer & Florian, 2000; Smith & Massey, 2012), heightened reliance on a romantic partner in times of need (Cox et al., 2008), and greater willingness to engage in social interactions (Taubman-Ben-Ari et al., 2002). In addition, Yaakobi, Mikulincer, and Shaver (2014) found that parenthood can serve as a buffer against mortality salience mainly among more secure people (those scoring relatively low on the avoidance dimension). Mortality salience led to more vivid and accessible parenthood-related cognitions, parenthood-related thoughts buffered the effects of mortality salience on death-thought accessibility, and thinking about infertility led to heightened death-thought accessibility mainly among participants who scored relatively low on attachment-related avoidance but not among highly avoidant people.

Caspi-Berkowitz (2003) also found that secure people reacted to death reminders by strengthening their desire to care for others. In her study, people read hypothetical scenarios in which a relationship partner was in danger

of death; the participants were then asked about their willingness to endanger their own life to save their partner's life. Securely attached people reacted to death reminders with heightened willingness to sacrifice themselves. Insecure people were generally averse to self-sacrifice and reacted to death reminders with less willingness to save others' lives. It's notable that insecure individuals, who seem more ready than secure ones to die for their self-enhancing cultural worldviews, are more reluctant to sacrifice themselves for a particular other person.

These studies imply that, even when faced with their biological finitude, secure people maintain felt security. They pursue the primary attachment strategy (seeking proximity to others); they heighten their sense of social connectedness and symbolically transform the threat of death into an opportunity to contribute to others and grow personally. This makes it seem that being part of a loving, accepting human world—having strong emotional and caring bonds with others—is a vehicle for self-transcendence (being part of a larger entity that transcends one's biological self). It promotes a sense of symbolic immortality, making it less necessary to validate one's worldview and promote oneself and one's own group.

Defensive, distorting reactions to mortality seem to result from recurrent failures of attachment figures to accomplish their protective, supportive, anxiety-buffering functions. As a result, insecure people lack a sense of continuity with and connection to the world, and are unable to rely on a solid psychological foundation that sustains vitality even in the face of mortality. Instead, they cling to particular cultural worldviews and derogate alternative views in an attempt to enhance their impoverished self-concepts and achieve a stronger sense of value and meaning. For avoidant individuals, these strategies seem to be effective in buffering existential fears at a conscious level. However, they are ineffective in decreasing the unconscious fear of death, and they leave avoidant individuals bothered by the uncertainty and uncontrollability of death. For anxiously attached individuals, adherence to cultural worldviews is ineffective in buffering death anxiety, perhaps because it is not an adequate antidote to hyperactivated fears, ruminations, and needs for protection, support, and love.

CONCLUDING REMARKS

Although death concerns can be terrifying, it would be a mistake to conclude that human beings are insufficiently equipped to deal with them or cannot do so without erecting psychologically distorting and socially damaging defenses. A host of studies show that people who have developed dispositional attachment security deal effectively with death reminders. Moreover, they deal with these reminders while remaining relatively open, optimistic, internally integrated, and well connected socially. I focus here on the protective aspect of felt security, but there are other relevant and important studies

on the effects of attachment security on compassion, gratitude, forgiveness, honesty, authenticity, and creativity (e.g., Gillath, Sesko, Shaver, & Chun, 2010; Mikulincer, Shaver, Gillath, & Nitzberg, 2005; Mikulincer, Shaver, & Rom, 2011; Mikulincer, Shaver, & Slav, 2006). Overall, a coherent body of research indicates that people who are treated well by others, beginning early in life, find life engaging, enjoyable, and meaningful and then are well equipped to deal with death reminders in a calm, confident, and egoless manner.

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Chapter 11

Terror Management Theory and Religious Belief

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As early as the Upper Paleolithic Era, our ancient ancestors began burying their comrades with symbolic grave-goods and creating works of art suggesting belief in supernatural existence (Mithen, 1996). In the *Chauvet Pont d'Arc*, a cave in Southern France known as the "prehistoric Sistene Chapel," the oldest known human drawings (~30,000 BCE) include hundreds of paintings of animals—lions, panthers, bears, hyenas. But they also feature paintings of sacred shamanic intermediaries and voluptuous "Venus" figures, representing a type of earth-goddess with spiritual powers over the natural world, capable of ensuring success in hunting and fertility to land and women (BBC, 2014a, 2014b; McClellan, 2006). Elsewhere, archeological excavations reveal burial sites adorned with symbolic items for the immortal souls of the deceased to use during their passage to the afterlife (Tattersall, 1998).

These relics, indicating human belief in intangible spirits beyond the natural limitations of the body, place the emergence of supernatural religious concepts alongside the advent of communal living, symbolic thinking, language, and self-consciousness (Burkert, 1996; Donald, 1991; Langer, 1984; Mithen, 1996). This infusion of human life with supernatural life is ancient, yet remains a widespread aspect of human experience. Even today, as headlines tout the increasing numbers of individuals rejecting religion, research still finds nearly 85% of people worldwide with religious beliefs (Zuckerman, 2005) and about 82% who claim religion constitute an important part of their everyday life (Crabtree, 2009).

Why have religious beliefs been such a stable and wide-reaching force in human culture? Numerous answers have been offered. Some (e.g., Freud, 1927) have argued that religion soothes anxiety in the face of inexplicable and uncontrollable natural phenomena, and protects people from their own destructive instincts to aggress against the self, others, and civilization. Others

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posited that religion serves an important social function, binding people together into common faith communities (Durkheim, 1912/1995; Graham & Haidt, 2010), providing members with valuable social identity (Ysseldyk, Matheson, & Anisman, 2010). Some offer that religion is a natural by-product of ordinary cognitive processes (Barrett & Zahl, 2013), such as when the adaptive propensity to attribute action (e.g., a flying arrow) to human-like agents (e.g., a raider) leads people to attribute activity with no human agent (e.g., stormy weather) to unseen supernatural beings or gods. And still others (Dawkins, 2006) offer that religion is merely a parasitic *meme* (unit of cultural inheritance) that entered the "meme pool" (akin to the gene pool) at great expense to the "hosts" yet nevertheless passes down each generation by preying on the human desire for immortality.

But each of these perspectives assumes an underlying motivation—to control anxiety, protect against threat, bond with fellow members of faith communities, and achieve immortality (despite great physical and societal expense). Even proponents of some of these ideas have hinted at these underlying, existential motivations, as Richard Dawkins did while explaining the spread of religious memes: "The idea of immortality itself survives and spreads because it caters to wishful thinking. And wishful thinking counts, because human psychology has a near-universal tendency to let belief be colored by desire" (2006, p. 221). But, why wish for immortality? And exactly how would such a belief be colored by desire?

Based on existential philosophy and anthropology (Becker, 1973; Burkert, 1996), terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) proposes that religious belief in spiritual immortality, souls, gods, and other supernatural concepts stems from a basic motivation to manage the awareness of our impending mortality. TMT explains *why* people are motivated to hold religious beliefs, *what* the social consequences are, *who* is impacted by that motivation and its various orientations, and *how* the body shapes that motivation to believe.

TIME MANAGEMENT THEORY RESEARCH AND RELIGIOUS FAITH

> *Religion is based, I think, primarily and mainly upon fear. It is partly the terror of the unknown and partly the wish to feel that you have a kind of elder brother who will stand by you in all your troubles and disputes. Fear is the basis of the whole thing—fear of the mysterious, fear of defeat, fear of death.*
>
> Bertrand Russell (1957, p. 22)

Just as the hummingbird seeks nectar and the bearded seal avoids polar bears, humans became adapted toward self-preservation and reproduction. But, unlike these other animals, the adaptive pressures that allowed humans to survive and reproduce also led to particularly sophisticated cognitive

capacities for self-representational thought (Tooby & Cosmides, 1992). Other creatures' cognitive representations are connected directly to their encountered stimuli, but humans can interpret and organize arbitrary symbols for events, objects, and people—including themselves—and mentally simulate space and time. The hummingbird pokes its beak into the flower to check for food, and the bearded seals "sing songs" to attract mates; but only the human can worry the lid of a latte while she helps her kid struggle through his math homework, silently sighing to herself and wondering if he will similarly take care of her when the time comes. That is, in allowing us to better interpret, organize, and understand our world—past, present, and future—these adaptive developments also produced the ability to recognize our mortality.

Yet because this cognitively sophisticated awareness of mortality does not entail a direct physical threat (e.g., a polar bear on the hunt), and thus cannot be resolved through reasonable physical response (e.g., evading the bear), it led to a unique *psychological* adaptation. Building on the work of cultural anthropologist Ernest Becker (1973; cf., Rank, 1936/1950), TMT posits that humans manage the awareness of their impermanence by perceiving themselves as qualifying for at least some form of permanence. To do so, humans fabricate and participate in *cultural worldviews*: sophisticated systems of belief that give order, meaning, and significance to the world. Cultural worldviews are diverse—including religious, ethnic, political, scientific, or other beliefs—and they spell out the standards and values for navigating the world. Second, they strive to accrue culturally relevant *self-esteem* by meeting or exceeding cultural standards. In doing so, the resulting self-esteem signals whether or not one has made meaningful, valued achievements worthy of cultural permanence.

The death-denying permanence offered by one's cultural worldviews can take at least one of two forms. For the first form, people can strive for *nonsupernatural (secular) immortality*: the impression that one's activity will leave a lasting legacy by which to be remembered after one is physically gone (see Chapter 13, this volume). For example, many academics adhere to the "publish or perish" mantra, striving to meet or exceed their field's valued scientific standards, in the hope of contributing information of lasting value to current and future generations; other worldviews might guide contributions to the future of one's family, business, service/charities, education, healthcare, government, art, sports, or any number of other available spheres. For the second form, people may strive for *supernatural immortality*: the impression that, despite natural death, our supernatural essence will literally continue to live on (afterlife).

Faith in Supernatural Immortality

Religions are unique in that they can offer both nonsupernatural and supernatural immortality. Of course, many believers take meaningful strides toward nonsupernatural immortality, ensuring their own beliefs spread to

future generations, such as by raising children in their denomination, offering money to one's religious organization, or proselytizing. In this way, perpetuating one's preferred religious belief is little different than perpetuating one's secular preference for a cricket team, music genre, or political party—a sense of permanence is gained by passing along some aspect of oneself to others, within the bounds of the natural world, via physical or social means.

But, powerfully, religions are primarily oriented toward the pursuit of supernatural immortality. Indeed, the earliest written narrative available, the Epic of Gilgamesh—believed to have originated around 3000 BCE in ancient Sumaria—focuses on Gilgamesh's encounter with the death of his friend Enkidu, provoking Gilgamesh to embark on a quest to thwart death with eternal life. Likewise, many Hindus, for example, follow the *śruti* scriptures (the four *Vedic* texts), conduct worship at temple, and believe their deeds on earth determine (*karma*) how their soul is transmigrated and reincarnated (*sasāra*)—all of which stem from the belief that in doing so one may seek permanent spiritual release from a mortal body (*moksa*). Similar efforts toward supernatural immortality are guided by Christianity (heaven), Islam (*jannat al-na'im*, gardens of delight), and Buddhism (*ching*, the pure land), among others. Despite variation in names and other trimmings, all religions function similarly to offer a reassuring promise of spiritual immortality, helping humans cope with the awareness of their eventual creep toward the grave.

Research testing this idea utilizes two simple approaches to testing TMT: the mortality salience (MS) hypothesis and the buffering hypothesis (see Chapter 1, this volume). First, according to the *MS hypothesis*, if faith in cultural worldviews (secular or supernatural) and self-esteem provide protection from death-related concerns, then heightened awareness of death should motivate increased reliance on them. Testing this hypothesis involves randomly assigning participants either to conditions that increase death awareness (MS) or conditions that involve nondeath-related stimuli, and then observing the effects of that manipulation on self-esteem striving and efforts to uphold cultural beliefs. Hundreds of studies have supported this hypothesis, using many different forms of death reminders (e.g., short essay prompts, subliminal presentations of the word "death" during computer tasks, and even proximity to local cemeteries) and control topic stimuli (e.g., pain, failure, ostracism, worrying thoughts, meaninglessness, self-uncertainty, etc.), in a wide range of cultural domains, with a wide range of demographics, and in dozens of countries on at least five continents (for review, see Chapter 1, this volume). For example, Greenberg et al. (1990) found that, compared to a nondeath-related control condition, MS led Christians to show increased reliance on their own death-denying religious worldview by increasing support for a fellow Christian but not for a Jewish person. Similarly, Osarchuk and Tatz (1973) found that religious believers reminded of death increased their faith in the afterlife.

Other research has adopted the *buffering hypothesis* in testing the role of afterlife belief in protecting individuals from mortality. According to this hypothesis, if cultural worldview beliefs and self-esteem provide protection from death-related concerns, then affirming them should buffer against anxiety and defensive reactions to mortality concerns. For example, Schoenrade (1989) found that, when confronted with death awareness, participants with a strong afterlife belief viewed death as having more positive and fewer negative implications. In other experiments, Dechesne et al. (2003) tested whether affirming supernatural immortality would buffer against the effect of MS on worldview-relevant defensive responses (i.e., self-esteem striving and worldview defense). Half of participants read an article (falsely) claiming that Harvard medical researchers examined over 600 cases of out-of-body near-death experiences—in which over 98% reported floating above their bodies and medical personnel, moving through a tunnel of light, feeling comfort, and interacting with deceased friends—and concluded that the preponderance of such similar experiences could be attributed to the existence of an afterlife. The other half of participants read an article describing those same out-of-body near-death experiences, but debunking them as a by-product of biological processes, such as oxygen deprivation in the brain. In the afterlife-debunked condition, MS (vs control topic) led to the typical boost in defensive responding. But that effect was eliminated when participants read the article affirming the existence of afterlife. These findings highlight supernatural immortality as religion's unique protection from death concerns.

Faith in Supernatural Agency

Religions are also unique, however, in that they complement the idea of supernatural immortality with examples of such spiritually unbounded beings. Indeed, every religion features immortal, supernatural agents. The Maori pantheon features *Io*, *Tangaloa*, and *Rangi*; the Christian supernatural ranks include gods, demons, angels, and saints; the Indic pantheon includes the Trimurti (*Brahma*, *Vishnu*, *Shiva*) and various other gods (*devas*); and so on among all other religions. As anthropologist Bronislaw Malinowski (1948) explained,

> *Man's conviction of continued life is one of the supreme gifts of religion... suggested by self-preservation—the hope of continued life and the fear of annihilation. The belief in spirits is the result of the belief in immortality. The substance of which the spirits are made is the full-blooded passion and desire for life...Religion saves man from a surrender to death and destruction... (p. 51).*

Thus, from a TMT perspective, the presumed existence of gods, spirits, and other supernatural agents provide "evidence" that immortal spiritual existence is a real possibility.

Research has tested the terror management function of faith in supernatural agents. In some studies, MS not only boosted general religious faith, but also specifically increased belief in god and divine intervention (Norenzayan & Hansen, 2006). Likewise, Vail, Arndt, and Abdollahi (2012) found, in one study, that MS motivated American Christians to increase faith that Jesus/God exists, answers prayers, and can intervene in the world. In a second study, MS motivated Iranian Muslims to increase faith that Allah exists, answers prayers, and can intervene in the world. These results demonstrate that in managing the awareness of death, religious individuals not only bolster their religious belief, but specifically bolster their faith in their religion's conceptualization of supernatural agents.

Further, religious creation stories can help humans cope with their mortal confines, offering a spiritual cosmogony consistent with the concepts of supernatural immortality and agency. The *Enuma Elish* (c.1700 BCE), a collection of seven Bronze Age Babylonian tablets, concerns Marduk's violent struggle to become king of the gods and how he fashioned heaven, earth, and humankind from the slain corpses of other gods (Lambert & Parker, 1966). The ancient Egyptian *Pyramid Texts* (c.2400 BCE) describe a more peaceful spiritual beginning, in which the world emerged from an infinite, lifeless sea of chaos as the primordial gods caused the sun to rise for the first time (Leeming, 2010). Whether through divine lovemaking, the spoils of heavenly battle, or telekinetic fiat, creation stories offer a spiritual history that connects human souls to an infinite spiritual realm. Further, creation stories and other religious myths typically pay believers immense self-esteem boosting compliments, suggesting that their very existence is the culmination of a divine spiritual drama and of immense importance to the gods.

Researchers have tested the idea that creation stories serve a terror management function using the *death-thought accessibility (DTA) hypothesis*, which posits that if cultural worldview beliefs and self-esteem provide protection from death-related concerns, then threatening these constructs should bring death thoughts closer to conscious awareness. Increases in DTA can be observed when people become more likely to complete word fragments like GRA_ _ as death-related (GRAVE) rather than neutral (GRANT) words, or when they demonstrate faster reaction times when identifying death-related words (dead, coffin, etc.) in a computer task (see Chapter 1, this volume). Using this approach, Schimel, Hayes, Williams, and Jahrig (2007) found that creationists displayed increased DTA after they were exposed to a scientific article challenging creationism and arguing in favor of evolution, but not after they read a neutral article. Other research has found that MS can increase faith in intelligent design (creationism) rather than evolutionary theory (Tracey, Hart, & Martens, 2011). Together, these findings demonstrate how faith in supernatural agency and immortality further fuels religion's unique protection from death concerns.

THE SOCIAL MAINTENANCE OF RELIGIOUS FAITH

Because cultural worldviews, including religious ones, are conceptual figments created by humans, faith in them involves heavy investment in ideas that can never be objectively substantiated or conclusively determined to be "correct." And without any directly observable evidence confirming the existence of fundamental religious concepts, such as souls, spirits, angels, demons, heavens, gods, or any other such supernatural phenomena, confidence in these concepts is profoundly dependent on consensual social validation (Berger & Luckmann, 1967). When other people share one's worldview, that consensus helps affirm the worldview as a valid and worthwhile set of beliefs. But when others reject one's worldview and/or hold an alternative or competing set of beliefs, they raise the possibility that one's own way of life might either be wrong or irrelevant as a path to immortality. As a result, people engage in various psychological defenses to maintain the perceived legitimacy of their death-denying religious worldviews.

One such defense is the process of *bolstering fellow believers*, which involves expressing positive support for people and information that affirm the validity of one's own religious worldview. As but one example, Christians make up about 70% of the population in the United States (Pew Research Center, 2015), yet during their long history as the overwhelming American majority they have rarely placed non-Christian candidates in public office and have instead disproportionately elected their fellow Christians. About 91% of the current (115th) US Congress is Christian (Pew Research Center, 2017a), every single US President has believed in God (or at least claimed to), and all but one President (Jefferson) has identified himself as Christian (Pew Research Center, 2017b). From the TMT perspective, such strong support for their fellow Christians reflects the existential motivation to bolster the perceived legitimacy of their death-denying worldview.

A second defense is *derogation*, which involves expressing negative attitudes and opposition to people and information that threaten the legitimacy of one's death-denying worldview. Consider, for example, Mike Huckabee—former Baptist minister, Arkansas governor, two-time Republican Presidential primary candidate, and television and radio talkshow host—who on his syndicated radio show said:

> *I know we're not supposed to say anything unkind about Islam... I get that. But... [it's] a religion that promotes the most murderous mayhem on the planet in their so-called 'holiest days"...the Muslims will go to the mosque, and they will have their day of prayer, and they come out of there like uncorked animals—throwing rocks and burning cars.*
>
> Poor (2013, para 3)

According to TMT, such sentiments reflect motivation to attenuate death-related anxieties by delegitimizing alternative religious worldviews as

inhuman garbage. But Huckabee is certainly not alone in his sentiment. Recently, US President Donald Trump issued a ban on immigration from seven Muslim-majority nations, a move which polls showed was supported by over half of the nation (Kirk & Scott, 2017). And, more generally, whereas polls show that the predominantly Christian US population has a generally warm attitude toward their Judeo/Christian neighbors in America, they have much colder attitudes toward people of alternative belief systems (e.g., Buddhists, Hindus, Mormons) especially Muslims and atheists (Pew Research Center, 2014). Indeed, substantial portions of the population feel that Muslims around the world are both hostile to the West and a threat to its religious beliefs (Gallup, 2017).

Research has found ample evidence supporting the terror management function of the bolstering and derogation defenses. One early study found that when American Christian participants were reminded of death (vs control topic), they bolstered positive judgments of a target when described as a fellow Christian yet made harsh judgments of that same target when described as a Jewish person (Greenberg et al., 1990). Similar work conducted among Muslims in Indonesia found that MS bolstered their support for a fellow student who expressed desire for the government to rule Indonesia according to Islamic law (*Sharia*) and derogated the emerging sect of the Ahmadiyya as heretics (Iqbal, O'Brien, Bliuc, & Vergani, 2016). Further demonstrating that bolstering and derogation are indeed specific to one's own worldview defense, MS did not lead to increased support for Sharia and rejection of the Ahmadiyya among non-Muslim Indonesians (Iqbal et al., 2016). MS also boosts people's desire to romantically date similar in-group members but not out-group members (Frischlich, Rieger, Dratsch, & Bente, 2015). In the religious context, MS likewise increased participants' positive feelings toward a potential long-term dating partner but only if the potential partner shared the participants' religious beliefs (Kosloff, Greenberg, Sullivan, & Weise, 2010). Such findings help to shed light on nation-wide sociological data showing that the vast majority of believers of nearly every religious faith tend to wed spouses of their own religion (Pew Research Center, 2015).

But even if one can bolster fellow believers and attempt to disparage competing worldviews, the continued propagation of compelling alternative worldview beliefs can continue to undermine the legitimacy of one's own overarching belief system. In such cases, people can be motivated to engage in the defensive strategy of *threat accommodation*, which involves keeping faith in one's core worldview beliefs but selectively modifying peripheral beliefs to now include otherwise-threatening ideas as a part of one's own belief system. Consider, for example, that in the *Book of Genesis*, the Bible describes God creating the heavens and the earth in 6 days, ending with the creation of humankind on the sixth day. In contrast, the scientific method, and Charles Darwin's work in naturalism in particular, has thus far

contributed to a large body of evidence compellingly explained by the theory of evolution—a perspective which directly contradicts the Biblical account that humankind was supernaturally created, from scratch, in its current form. Thus, if the theory of evolution is correct, and Christians encounter it, they will be forced to contend with the very real possibility that the source of their religious worldview—the Bible—is simply wrong. Such Christians can try to defend the legitimacy of their views by bolstering fellow believers or derogating evolution as "just a theory," but the fact is that the scientific evidence for evolution remains strong.

An alternative defense strategy, therefore, would be to adjust the Christian view to accommodate the otherwise-threatening idea of human evolution as part of a peripheral belief, while preserving the central belief that God exists and created everything. Indeed, this is how the Church has responded to scientific consensus about evolution, as the current Pope (Francis) explained:

> *When we read in Genesis the account of Creation, we risk imagining God as a magician, with a wand able to make everything. But it is not so. . . .He created beings and allowed them to. . .develop and to arrive at their fullness of being. . .And so creation continued for centuries and centuries, millennia and millennia, until it became that which we know today. The Big Bang, which nowadays is posited as the origin of the world, does not contradict the divine act of creating, but rather requires it. The evolution of nature does not contrast with the notion of creation, as evolution presupposes the creation of beings that evolve.*
>
> Vatican Information Service (2014)

The point here is that the Bible mentions nothing about evolution or the Big Bang; those are ideas in the scientific community that potentially undermine the validity of the Bible. The Pope, however, accommodated those ideas into his periphery so that they no longer threaten the core belief that a creator god exists and that Christianity is a valid path to immortality. This interpretation is consistent with TMT research. Hayes et al. (2015, Study 2) recruited participants with strong belief in creationism and rejection of naturalistic explanations of human origins. When exposed to information highlighting evidence for evolution and refuting creationism, MS caused participants to reduce their rejection of evolution (peripheral belief) but keep their faith in God (core belief)—thus accommodating the threat into their extant worldview.

Alternatively, one might take a more active role in the defense of one's death-denying beliefs by attempting to *assimilate nonbelievers* into one's religious worldview. Such assimilation efforts are exemplified by the 3rd century travels of Buddhist *Dharma Bhanaks* throughout Asia, Muslim Imams' *dhawa* (missionary) efforts in Africa and the Middle East following the early Islamic Conquests (7–8th century), and Christian efforts to follow

Jesus' instructions to "Go into all the world and proclaim the good news to the whole creation" (Mark 16:15-16). And the tone of such proselytizing effort can range widely, from offering friendly and welcoming environments for others to learn about one's worldview beliefs, such as Hindu ISKCON events, mosque open-houses, or church Sunday schools, to the more bold and bloody attempts to forcibly convert suspected heretics and nonbelievers, such as occurred during the Christian Inquisitions. Research points to the terror management function of such assimilation efforts. In one study (Kosloff, Cesario, & Martens, 2017), Christian participants were exposed to MS (vs control) and then given the opportunity to either advise or derogate an atheist. MS motivated participants to derogate the atheist if portrayed as staunchly unreceptive to religious concepts; but if the atheist was portrayed as being open-minded, MS instead led participants to more zealously advise them to go to church and read the Bible. Thus, MS can lead people to bypass derogation in favor of an opportunity to simply convert a nonbeliever, turning social worldview-threat into validation.

But attempts at derogating, accommodating, and/or assimilating do not guarantee that threats to one's religious worldview will be effectively reduced. However, there remains a figurative—and potentially literal—"nuclear option." Social threat to one's religious beliefs can be effectively eliminated by efforts to *annihilate* the challenging people and ideas. From contemporary culture clashes to earlier tribal wars, and from East to West, religious believers have engaged in street fights, terrorism, military incursions, and even full-scale genocides to defend the legitimacy and primacy of their beliefs.

Even religious texts themselves sometimes blatantly urge believers to annihilate nonbelievers. The infamous *sword verse* (Quran 9:5) urges Muslims to "...kill the unbelievers wherever you find them and capture them and besiege them and lie in wait for them at every place of ambush. But if they should repent, establish prayer, and practice charity, then leave them free. Indeed, Allah is forgiving and merciful." And Deuteronomy 13:6-9 likewise proposes to Christians that, "If your very own brother, or your son or daughter, or the wife you love, or your closest friend, secretly entices you, saying, 'let us go and worship other gods'...do not yield to them or listen to them. Show them no pity. Do not spare them or shield them. You must certainly put them to death." Such scriptural calls set the stage for sectarian violence, such as Anders Breivik's 2011 bombings and shootings in Norway, which left 77 dead and at least 319 injured. Breivik left behind a detailed manifesto, in which he essentially called for a second Crusade—a renewed Christian war to defend European Christian culture against the threat of Muslim domination (Erlanger & Scott, 2017). Further, policy analysts point out that, compared to wars over secular disputes, religious wars are historically more frequent, devastating, and have a higher likelihood of recurrence (Toft, 2007).

Recent research compellingly illustrates how death-related anxiety can fuel such religious violence. In one experiment (Hayes, Schimel, & Williams, 2008),

American Christian participants were exposed to either an article about a neutral topic or an article about how the Christian holy city of Nazareth (Jesus' hometown) is becoming dominated by Muslims. Compared to the neutral topic, exposure to the article about the "Islamification" of Nazareth increased the Christians' DTA. However, that effect on DTA was eliminated when participants were also exposed to a report showing that a plane full of Muslims had been killed in a crash. This rather chilling result shows that threats to one's religion can increase DTA, but the DTA can be attenuated again by perceived annihilation of people representing those threatening ideas.

In similar research (Pyszczynski et al., 2006), Iranian students were exposed to either MS or a control topic, and then asked to evaluate two fellow students. One student spoke about portraying Islam as peaceful; the other advocated Islamic martyrdom-missions (suicide terrorism) against the United States. Under control conditions, participants preferred the pro-peace student; but MS strongly increased preference for the pro-martyrdom student and even increased self-reported willingness to join the cause—to sacrifice oneself in defending Islam against the West. Such research provides insight into the motivations behind Anders Breivik's violent defense of Christian European culture, but also the past century's rise in Islamic terrorism, troubles between Protestants and Catholics in Ireland, and ill-treatment of Muslims in Palestine, Jews in Europe, Hindus in Sri Lanka, and many other similar religious culture clashes.

VARIATION IN RELIGIOUS ORIENTATIONS

Whereas all the world's religions serve to help mitigate death-related anxieties, there exists a fair amount of variation in the way that people wield religion to serve that function. Some folks may be uncertain or skeptical of religious ideas, whereas others may invest exclusively in their religions' scriptural fundamentals. Some people rely on religion because they truly believe in religious supernatural ideas, whereas others are involved in religion for its nonsupernatural immortality opportunities. And still others might be engaged in a more open-minded search for spiritual enlightenment. We next consider how these differences in religious orientation can impact the ways that religion is used (or not) as a terror management strategy.

Skepticism

Although a large amount of research shows that religious belief can function as a powerful and direct method of managing existential concerns, not all describe themselves as religious. The majority of people globally are religious, but the growing numbers of nonreligious are striking (Pew Research Center, 2015). Some are simply raised without religion, whereas others

actively identify as nonreligious, for one reason or another, and variation exists even among those growing numbers of skeptics describing themselves as "non-religious," ranging from not-religious-but-spiritual, to agnostic, to more strictly atheist.

For example, roughly 50% of those reporting "no religion" believe supernatural/spiritual concepts, yet distance themselves from sometimes objectionable organized religions (Baker & Smith, 2009; Vernon, 1969); and among those identifying as religiously "unaffiliated," 30.26% regarded religion as personally important. Thus, large portions of the so-called "religious nones" may be more skeptical of religious social organizations than that of the supernatural concepts (e.g., gods, souls, heaven) they represent. Research may find that these "spiritual but not religious" individuals, though reluctant to affiliate with religious organizations, still manage death awareness by expressing faith in supernatural concepts. Yet others, such as agnostics and atheists, appear more genuinely skeptical of supernatural ideas, each representing variation in that skepticism.

Agnosticism is characterized by uncertainty about religious claims about the supernatural, pointing out that the supernatural is by definition beyond natural observation, and cannot be known by humans to exist or not-exist (e.g., Russell, 1927/1957, 1947; Stephen, 1893). But, ultimately, one cannot simultaneously believe and not-believe. So, as Blaise Pascal (1669/1995) notoriously argued: although the agnostic may be skeptical, when faced with existential concerns the safe bet is to believe and gain the possibility of eternal life. Indeed, research has shown that although agnostics expressed low religious faith in a control condition, MS led them to "hedge their bets"—reporting stronger general religiosity, faith in a higher power, and faith in Christian, Islamic, and Buddhist supernatural agents (Vail, Arndt, & Abdollahi, 2012). These findings suggest agnostics may be uncertain, yet open-minded when it comes to religious terror management.

Atheism, however, is more strongly skeptical, involving at least the lack of belief in supernatural concepts and at most the outright rejection of the supernatural (Dawkins, 2006). The direct terror managing power of religious belief may indeed be as appealing to atheists as anyone else, but these individuals may override the desire for supernatural concepts (such as gods, souls, afterlife) with a more rational, logical analysis. Indeed, building on research suggesting religious cognition is "naturally" intuitive (e.g., Barrett, 2004; Bering, 2006; Bloom, 2007), emerging evidence shows that believers and unbelievers alike may respond to death awareness by—at least initially—implicitly activating theistic/supernatural concepts (e.g., Jong, Halberstadt, & Bluemke, 2012). However, several other studies show that after MS atheists override that implicit activation, to explicitly reject religion and the various possible supernatural agents (Jong et al., 2012; Vail et al., 2012).

Additional work similarly suggests that atheists may be analytically overriding the implicit activation of religious concepts when aware of death

(Vail & Soenke, 2017). For example, in one study MS caused Christians to increase religious faith after a neutral task, but not after a task designed to promote analytic thinking. Such findings show that even religious samples can look like atheist samples—where MS fails to lead to strengthened faith—when participants are prompted to override intuitions and engage in analytic thinking. Another study (Vail & Soenke, 2017) found that MS caused religious participants to rely more strongly on intuition (reduced need for cognition), whereas MS motivated atheist participants to increase critical thinking (need for cognition). And a third study (Vail & Soenke, 2017) found that MS caused atheists to express greater *desire* for but express reduced *belief* in religious concepts—indicating that atheists acknowledged the intuitive appeal of supernatural concepts but nevertheless rejected them. Each of the findings suggests that atheists may be analytically overriding the implicit activation of religious concepts when aware of death.

Other research has explored the idea that abstaining from religious belief leaves atheists (at least immediately) vulnerable to the negative impacts of existential threat. For example, in one study (Vail & Soenke, 2017) atheists reminded of death-reported lower perceived meaning in life, whereas Christians were unaffected. Such damaging effect of MS among atheists may, in turn, spur them to seek out and affirm death-denying secular worldview beliefs. Indeed, Vail and Soenke (2017) found that MS boosted atheists' certainty about their rejection of religion yet otherwise increased their ideological open-mindedness (reduced dogmatism), perhaps reflecting a search for viable secular beliefs. Future work might discover that instead of using religious beliefs, atheists manage death-related anxiety by relying upon secular beliefs, such as those based on knowledge/science (Farias, Newheiser, Kahane, & Toledo, 2013; Williams, Schimel, Hayes, & Faucher, 2013), love/work (Mikulincer, Florian, & Hirschberger, 2003; Yaakobi, 2015), compassion (Gailliot, Sillman, Schmeichel, Maner, & Plant, 2008), community (Motyl, et al., 2011), and moral progress (Rutjens, van der Pligt, & van Harreveld, 2009).

Colors of Religious Belief

Within the realm of believers, which is the majority of people around the world (Pew Research Center, 2015), variation in religious orientation appears to range along a continuum. The right-wing of the continuum seems to be characterized by strict fundamentalism, the center-wing by a softer yet genuine internalization of religious values and teachings, and the left-wing by a tolerant and open-minded exploration of the world's various religious beliefs.

Close-Minded Orientation

At the right-wing of the continuum are *religious fundamentalists*, believers who are intensely invested in their beliefs. The direct death-denying power

of religious belief can motivate believers to diligently follow their religion's prescriptions for righteous behavior, and fundamentalists believe their religion offers the basic inerrant truth about natural and spiritual issues, including the specific conditions to qualify for eternal spiritual life. Unsurprisingly then, the fundamentalist's approach is that their religion's truth must be strictly followed to the letter, and that deviation from those truths represents evil spiritual corruptions that must be forcefully resisted (Altemeyer & Hunsberger, 1992). From the TMT perspective, fundamentalists essentially put "all their eggs in one basket," focusing on their religion as the one and only correct way of life, strictly adhering to their religion to the exclusion of other worldview belief systems.

Research supporting that idea has shown, for example, that American Christian fundamentalists experience increased DTA when exposed to information that challenges the literal truth of the Bible (Friedman & Rholes, 2007; see also Koca-Atabey & Oner-Ozkan, 2011 for similar findings among Turkish Muslims). Likewise, whereas people low in religious fundamentalism still respond to MS with increased secular worldview defenses, religious fundamentalists do not (Friedman & Rholes, 2008). And when analyzing written responses to MS primes, fundamentalists exhibited less cognitive complexity but more peace, acceptance, and assurance about the afterlife—which statistically explained (mediated) why they did not tend to engage in secular worldview defense.

Instead, fundamentalists tend to adhere, strictly, to their religion's prescribed attitudes and behaviors. As one striking example, when faced with medical problems, fundamentalists may insist on faithfully following their religion's prescribed methods for physical healing through spiritual devotion (e.g., prayer), rather than modern scientific medical treatment. Such was the case for reggae legend Bob Marley, who developed a treatable form of cancer in his toe. However, his strict commitment to his Rastafarian beliefs led him to refuse the standard medical treatment (amputation of the afflicted toe)—a religion conviction that led to his otherwise-preventable death (White, 1983). Research has shown that existential concerns about death may motivate such faith-based medical refusals (Vess, Arndt, Cox, Routledge, & Goldenberg, 2009); when fundamentalists were reminded of death, they were more supportive of prayer over medical treatment and reported being more willing to rely on their faith alone to heal.

Such intense fidelity brings with it the potential for some toxic social relationships, as fundamentalists appear to be particularly hostile toward people of other faiths and sects when defending their own death-denying religion. Indeed, research shows that fundamentalism is associated with greater rejection of people with different sacred beliefs, greater racial prejudice and ethnocentrism, and greater defensive aggression and militarism (e.g., Altemeyer & Hunsberger, 1992; Henderson-King, Henderson-King, Bolea, Koches, & Kauffman, 2004). For example, the so-called Islamic State, a

group following the fundamentalist Wahhabi doctrine of Sunni Islam, insists on its own set of beliefs and rejects other religions—including other more tolerant sects of Islam, such as Sufism. As a result, in the predominantly Sufi region of Pakistan's Sindh province, in the town of Sehwan, Islamic State arranged an attack on Sufi worshipers during a sacred ceremony at the popular shrine to Sufi saint Lal Shahbaz Qalandar, killing at least 72 Sufi devotees and wounding another 250, making it one of the most violent sectarian attacks in years (BBC, 2017).

But, although existential concerns might otherwise motivate fundamentalists toward violent worldview defenses, it is important to remember that many religious beliefs include values like kindness, tolerance, and compassion. Biblical passages highlight Jesus' instruction to "love your neighbor as yourself" (Mark 12:31) and Quranic passages call on Muslims to "do good to others, as god has done good to you" (Sura 28:77). And it turns out that simply priming such prosocial religious passages can encourage similarly charitable and helpful behavior (Pichon, Boccato, & Saroglou, 2007; Shariff & Norenzayan, 2007). The fundamentalists' strict adherence to what they perceive as the inerrant word of god, contained in their religious scripture, then creates an interesting situation where a focus on prosocial scriptural teachings might conflict with fundamentalists' otherwise violent defense of the religion.

A series of studies tested that possibility (Rothschild, Abdollahi, & Pyszczynski, 2009). In the first study, American Christian fundamentalists were first exposed to MS (vs control topic), then presented with compassionate scriptural teachings (vs compassionate secular teaching vs neutral statements), and then asked to rate their support for violent worldview defenses. In the control conditions, fundamentalists supported extreme military actions against worldview threats abroad, including the use of chemical and nuclear arms and the collateral killing of thousands of civilians. When they were instead exposed to compassionate religious scripture, MS motivated them to follow those scriptural injunctions and they substantially reduced their support for violence. The finding was replicated in Iran among Shi'a Muslims (Rothschild et al., 2009). Together, these findings show that in light of fundamentalists' strict commitment to their religious faith and texts, making salient the more compassionate scriptural passages may be the key to promoting peaceful religious terror management even among fundamentalists.

Mainstream Orientations

At the center of the continuum is the difference between intrinsic and extrinsic religiosity. Believers who are *intrinsically religious* have genuinely internalized the teachings and values of their religion, and are focused on the spiritual rewards to be gained through faith. The *extrinsically religious*, however, are involved in religion for the social benefits and focused

on the cultural legacy to be gained through contributions to one's congregation. The contrast can perhaps be illustrated by famed Czech music composers Antonín Dvořák and Leoš Janáček. Consistent with intrinsic religiosity, Dvořák was a devout Christian who played organ for his church and composed sacred music such as his *Requiem*, *Te Deum* (God, we laud You), *Mass in D Major*, and his *Stabat Mater*—a choral piece inspired by the death of his daughter, Josephina, and based on an old church hymn of the same name (Clapham, 1979). In contrast, although Janáček similarly composed "sacred music," such as his *Otčenáš* (Our Father), Ave Maria, and his *Glagolitic Mass*, Janáček was an atheist and—consistent with extrinsic religiosity—is generally considered to have written such "sacred" music not as an affirmation of religious faith but as a celebration the Slavic people's cultural legacy.

Compared to extrinsic religiosity, however, intrinsically religious believers tend to successfully adhere to religious values, reducing anxiety and improving satisfaction and meaning in life (Batson, Schoenrade, & Ventis, 1993). Such intrinsic reliance on religious faith, therefore, may help foster a sense of existential protection—preventing the need for alternative terror management defenses. Consistent with that idea, when the intrinsically religious were made aware of death, affirming their religiosity led them to report an increased sense of self-efficacy, which in turn predicted an increased positive emotional experience (Fischer, Greitmeyer, Kastenmuller, Jonas, & Frey, 2006). In related research, believers high and low in intrinsic religiosity either were, or were not, allowed to affirm their religious beliefs. They were then reminded of death (vs control topic), and then given the opportunity to express allegiance to their hometown as a measure of secular worldview defense. When not first affirming their religiosity, MS led participants to boost secular defenses. However, when first affirming their religiosity, intrinsically religious participants no longer engaged in worldview defenses after MS. Such findings indicate that internalizing one's religious faith and spirituality, to the point of being one's intrinsically dominant orientation, can serve as a useful resource when managing existential concerns about death.

Open-Minded Orientations

At the left-wing of the continuum are the more open-minded orientations toward exploring religious ideas. For example, believers with a *quest orientation* may claim roots in one or another religious tradition, but may not regard any one religious faith as having an inerrant spiritual truth. As but one example, composer Gustav Holst (best known for *The Planets*) emerged from roots in Western Christian culture, yet also actively sought insightful and inspiring truths from the world's various religious and secular wisdom—from the Western literature of Walt Whitman and Thomas Hardy, to

astrology, to the Hindu hymns and epics of the *Rig Veda*, *Ramayana*, and *Mahabarata*. Likewise, formal syncretic religious denominations, such as the Unitarian Universalist church and the Baha'i Faith, draw from the texts and teachings of Christian, Jewish, Muslim, Hindu, Buddhist, Zoroastrian, and other faiths, in their open-minded pursuit of spiritual truth, connection to god, and moral understanding of the world. Accordingly, research shows that quest orientation is correlated with welcoming attitudes toward unfamiliar people and ideas (Batson & Stocks, 2004). And other work (Vess, Routledge, Landau, & Arndt, 2009) shows that people with low need for dogmatic belief structure, perhaps a component of quest orientation, renders people particularly likely to seek existential comfort through the exploration of novel ideas.

Related phenomena are the emergence of programs aimed at *ecumenical outreach* or *interfaith fellowship*. Open-minded religious orientations frequently offer the idea that believers of all faiths share common cause and are all, in a sense, children of god. And classic research, such as the Robber's Cave study (Sherif, Harvey, White, Hood, & Sherif, 1961), illustrated that although "us-them" competition can spin intergroup relations into a whirlwind cycle of violence, peace can be restored through the awareness of common cause—of superordinate goals. Building on that idea, and the common in-group identity model (Gaertner, Dovidio, Anastasio, Bachman, & Rust, 1993), some work suggests that fostering common cause among religious groups through ecumenical or interfaith programs can help promote a more open-minded and more peaceful social orientation when managing death-related concerns.

For example, in one set of studies (Motyl et al., 2011), American participants read vignettes about people's favorite childhood experiences (e.g., playing at the beach, camping) and then recalled their own similar childhood experiences. In one condition, those vignettes were supposedly authored by fellow Americans (e.g., Michael, from Orlando); but in a second condition, they were supposedly authored by a diverse range of people from around the world (e.g., Miguel, from Cuernavaca). After MS, participants primed with common in-group identity became more tolerant of immigrants, accepting of Arabs, and supportive of international peace-building. A similar set of studies (Pyszczynski et al., 2012) found that after reminders of a common cause (combatting global climate change), compared to localized problems (flooding), MS led to reduced support for militaristic attitudes and increased support for international peacebuilding. Additional studies replicated that finding among samples of Israeli Arabs and Israeli Jews during the 2009 Israeli military incursion into Gaza; MS motivated greater support for peaceful coexistence among those who imagined global warming and had high perceptions of common humanity. Thus, when ecumenical outreach or interfaith fellowship fosters a sense of common cause, with all faiths as children of god, then existential motivation may lead believers to express mutual care

and concern, support cooperation and peace, and avoid the continued infliction of sectarian violence both at home and abroad.

HOW THE HUMAN BODY SHAPES RELIGIOUS TERROR MANAGEMENT

> *There is a doctrine about the nature and place of the mind, which is prevalent among theorists, [to which] most philosophers, psychologists, and religious teachers subscribe with minor reservations, [that] every human being has both a body and a mind...The body and mind are ordinarily harnessed together, but after the death of the body the mind may continue to exist and function... Such in outline is the official theory, 'the dogma of the ghost in the machine.'*
>
> Gilbert Ryle (1949, pp. 11–16)

The commonly held idea that the body is a temporary home to the immortal soul, characterized by Gilbert Ryle as "the dogma of the ghost in the machine," was articulated and championed by figures like Thomas Aquinas (1266/1981) and René Descartes (1641/1984). But the idea stretches back to the beginnings of human culture—from Ancient Egyptians' belief in an "eternal self" termed *ba* (Redford, 2004) to descriptions of a soul on ancient (c.700 BCE) funerary monuments in southeastern Turkey (University of Chicago, 2008). Indeed, the dualistic view of body and soul appears to be intuitive and developmentally natural (Bloom, 2004).

But why would anyone contrive that their mind is separate from their body? From a TMT perspective, the tendency toward dualism represents a psychological solution to the existential problem of humans' awareness of their body's physical, mortal limitations. Indeed, research shows that inner mental qualities are often perceived as living on after death while physical traits are not (Bering & Bjorklund, 2004), and that a dualistic view of body and soul is positively associated with afterlife belief (Preston, Ritter, & Hepler, 2013; Riekki, Lindeman, & Lipsanen, 2013; Thalbourne, 1996). TMT research also shows that existential motivation can only lead to religious belief—to death-denying faith in supernatural concepts such as souls, gods, and the afterlife—when people hold sufficient mind-body dualism beliefs (Heflick, Goldenberg, Hart, & Kamp, 2015). In that light, we first consider why people would view body and soul through the lens of dualism—as a ghost in the machine—believing in an immortal soul capable of flowing beyond the boundaries of its physical container.

The Ghost in the Machine

Since the beginnings of their awareness of mortality, we humans would have been witness to the eventual death of nearly every living being they found. And, equipped with that awareness, we would have been faced with

the realization that—despite now being primates able to put plasma screen TVs in every corner of our treehouses—we are still essentially walking, talking meat-bags, no more or less substantial than a lizard, lion, or ladybug. Like these other animals, we are creatures compelled to eat, drink, and have sex; and like other animals, we excrete all manner of fluids, discharge waste, catch diseases, age, wrinkle, warp, and eventually die. Such "creaturely" characteristics of our physical bodies serve as constant reminders of our natural limitations and impending demise. In that light, it is little surprise that research (Cox, Goldenberg, Pyszczynski, & Weise, 2007; Goldenberg, Cox, Pyszczynski, Greenberg, & Solomon, 2002) finds increased DTA when people are reminded of creaturely aspects of human nature, such as vulnerability to disease and injury, and basic body functions like peeing, pooping, and having sex.

The existential minefield of our physical vessels, then, creates the motivation to view ourselves as more than just another base, mortal animal. For example, in Buddhist legend the Shakya prince Siddhartha Gautama, who until age 29 had supposedly been shielded from suffering, repeatedly ventured by chariot beyond the walls of his palace to meet his subjects. On these trips, he witnessed for the first time aging, disease, and death. When his charioteer informed him that such vagaries await everyone, the future Buddha immediately absconded to adopt the life of an ascetic, attempting to overcome the body through yogic meditation and extreme purification rituals, including a fast that nearly killed him. In that regard, religious ideas often represent efforts to overcome the body—to rise above one's debauched physical nature.

Such renunciation of base, animal urges can be seen in religious restrictions on bodily functions, such as prolonged fasting, mandated celibacy, or proscriptions against masturbation; or seen in religious modifications to one's physical appearance, including head- or hair-coverings, full-coverage clothing, tattoos, and/or piercings, symbolically shrouding the physical ignobility of the body; or various religious body-purification rites, such as ritual ablutions (washing), baptism, circumcision, genital mutilation, and self-flagellation, highlighting some of the more extreme efforts of believers to distance themselves from the body's corporeal nature. Research supports the idea that religious efforts to overcome the body are driven by motivation for death-denial. Death awareness increases support for information that places humanity above other animals (Goldenberg et al., 2001), and motivates committed believers to feel more strongly disconnected from the natural world (Vess & Arndt, 2008). Such motivation to distance from one's body is consistent with the emergence of the dualist idea that we humans have souls separable from our bodies, and that there is an unseen spiritual realm in which these and other spirits exist.

Further, religions also offer that the soul is not subject to the limitations of the natural world. Through the purity of their souls, various religious

figures have supposedly performed miraculous feats, transcending the natural limitations of the body, from resurrection, to exorcism, telekinetic healing, and transfiguration. Believers are routinely struck with awe that Buddha could walk on water, fly through space, multiply himself into a million and back again, grow and shrink at will, and produce fire from his upper body and water from his lower body; that St. Joseph of Cupertino could fly; that Moses parted the Red Sea; that Mohammad ascended directly to heaven; and that Jesus healed the sick, died and rose again, and changed water into wine. Truth to such claims would be evidence that dualism-based concepts like souls and gods and afterlife exist, and that by following in the footsteps of such figures one's own soul can become so pure that it can similarly break beyond the otherwise natural limitations of the body to enjoy eternal life.

If such expressions of spiritual power over nature are existentially comforting, then religious believers would likely be bothered by the thought that their sacred religious figures are confined to the same carnal bodily functions as other mortal animals. Death-denying faith in the Buddha's spiritual purity might be undermined, for example, by thinking that he had to interrupt his holy meditations, at least occasionally, to poop; or likewise by thinking that the prophet Mohammad occasionally got sick and puked up his lunch. Indeed, research has found (Beck, 2008) that participants with greater death anxiety reported being more uncomfortable while reading about a series of body problems Jesus may have experienced, such as gross-looking teeth, disgusting breath, or diarrhea during illness. Similarly, when fundamentalist Christians were first reminded that Jesus likely sometimes puked, had disgusting body odor, or got hungry/thirsty, among other bodily functions, MS actually reduced their faith in god, religion, and literal afterlife (Cox, Heflick, Goldenberg, & St. Arnaud, 2017). Together, these findings suggest that death anxiety motivates people to avoid thinking about the creatureliness of their religious figures, because being faced with their creaturely characteristics makes it difficult to maintain faith in death-denying spiritual concepts.

Similar research supports the idea that belief in one's own supernatural forces can serve a death-denying function (Cohen et al., 2017). For example, flying is a unique upward supernatural gesture representing a dualistic ability to literally rise toward the "heavens," above the body's otherwise natural boundaries. Accordingly, death reminders led participants to report more fantasies about flying; and MS did not increase worldview defense and DTA when participants first engaged in fantasies about flying. Further, the palliative effect of flight fantasies after MS was explained (mediated) by the heightened perception that flying freed participants from the limits of the human body. This existential motivation to literally rise above one's bodily limitations is consistent with the development of the dualist perception that the self is in fact a soul—a ghost in the machine—a purely nonphysical

spirit, temporarily inhabiting one's body yet destined to forever inhabit an eternal spiritual realm.

The Machine in the (Holy) Ghost

> *'the dogma of the ghost in the machine'... is not merely an assemblage of particular mistakes. It is one big mistake...*
>
> Gilbert Ryle (1949, pp. 15–16)

Although Cartesian dualism—the idea that the self is an eternal soul, separate from the body—may be appealing, as it supports death-denying religious concepts, it does not hold up to scientific scrutiny. The emergence of modern neuroscience and psychophysiological research demonstrates that body and soul are not separate and equal entities metaphysically harnessed together (dualism), but are instead—to borrow the computer metaphor—the cybernetic "hardware" and "software" components of a single complex system (monism). We therefore refer the reader to Chapter 16 (this volume) to consider some of the emerging research revealing the machine in the ghost—how the "hardware" of the body/brain may implement terror management processes, including the "religious software" of the mind.

CONCLUSION

The human motivation to manage the awareness of mortality helps provide a more complete understanding of why religious belief has been such a stable and wide-reaching force in human culture. Terror management processes fuel the dualistic belief that the self is an immortal soul, separate from the mortal body, and motivates religious faith in the spiritual purity of sacred religious figures and in the power of souls to conquer the limits of the natural world. Similarly, the awareness of death fuels faith in supernatural immortality (e.g., afterlife), supporting myths about supernatural agency (gods, spirits, creation), and social behaviors designed to bolster and protect the perceived legitimacy of such religious beliefs. Thus, although there is of course variation in particular religious orientation, the motivation to manage the awareness of death drives the vast and colorful landscapes of religious pursuit of supernatural immortality.

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Chapter 12

Secular Cultural Worldviews

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Secular societies believe they have left religion behind, when all they have done is substitute one set of myths for another.

John Gray, *Heresies: Against Progress and Other Illusions*

Terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986; Solomon, Greenberg, & Pyszczynski, 1991) is derived from cultural anthropologist Becker's (1971, 1973, 1975) efforts to elucidate the motivational underpinnings of human behavior. The theory postulates that the uniquely human awareness of death gives rise to potentially paralyzing existential terror that is managed by subscribing to cultural worldviews that afford a sense that one is a valuable participant in a meaningful universe in pursuit of literal and/or symbolic immortality.

For most of human history, and to this day, people managed existential terror primarily by adhering to religious worldviews (see Chapter 12, this volume) that provide explicit pathways to transcend death via literal immortality in the form of the heavens, reincarnations, resurrections, afterlives, and souls. Although secular worldviews, by contrast, have no obvious religious or spiritual basis, they are nevertheless, according to Becker (1973, p. 5), "mythical hero-system(s) in which people serve in order to earn a feeling of primary value, of cosmic specialness, of ultimate usefulness to creation, of unshakable meaning." This is accomplished primarily through opportunities to acquire various forms of symbolic immortality (Lifton, 1979), whereby people attain a sense that they are part of something enduring with extended and continuous ties to the past and the future. By forging psychological ties to people, places, and times beyond their own, individuals derive symbolic immortality from perceiving themselves as noteworthy participants in an ongoing historical process that overcomes the limitations of their personal finitude. In this chapter, we provide an overview of prominent secular

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worldviews along with research demonstrating that they, similar to religious worldviews, serve a terror management function.

GREAT NATIONS, FEARLESS LEADERS

One longstanding and presently pervasive secular worldview is nationalism, the conviction that one is a citizen of a great and enduring tribe or nation. Nationalistic people generally believe that they are the "chosen ones"—indeed, in some cultures, such as the Inuit and Kalili, the word for one's own group is synonymous with "man" or "human," implying an inherent superiority to all out-group members (Dissanayake, 1995)—who reside in a sacred "homeland," with a glorious past as well as a promising future that is destined to persist in perpetuity. Hitler, for example, came to power in the 1930s by promising to "Make Germany Great Again" in the aftermath of WW1; he was confident that the Third Reich would have a glorious and never-ending future. At the same time in China, Mao Zedong declared that the Communist revolution was "eternal and indestructible" (Lifton, 1968). From a terror management perspective then, nationalistic worldviews provide their denizens with a secure sense of self-regard (i.e., self-esteem) through identification with their tribe or nation, and symbolic immortality via assurances that their culture will persevere in space and over time, and that noteworthy (i.e., heroic) contributions to the culture will be memorialized and remembered.

In accord with this view, death reminders increase support for those who uphold nationalist sentiments and denigration of those who criticize them. For example, Greenberg et al. (1990, Study 3) had American participants, after a mortality salience (MS; see Chapter 1, this volume) or control induction, read essays purportedly written by a distinguished political scientist that either strongly favored or opposed the United States. Perhaps not surprisingly, the pro-US professor was rated more favorably than the anti-US professor in the control condition; however, this effect was significantly magnified in response to MS. Similarly, Castano, Yzerbyt, Paladino, and Sacchi (2002) found that Italian participants reminded of their mortality reported a greater sense that Italians have many characteristics in common and share a common fate, rated being Italian as a more important aspect of their identity, and viewed Italians more favorably compared to Germans. Additionally, Schimel, Hayes, Williams, and Jahrig (2007) demonstrated that Canadians who read an essay belittling Canadian secular values (Canadian food, ice hockey, and socialized medicine) subsequently had increased death thought accessibility (DTA). Finally, Routledge and Arndt (2008) showed that MS increased British participants' willingness to make personal sacrifices, including dying, to protect the British way of life.

Related (although not confined) to nationalist worldviews is the tendency for people to fervently embrace their leaders, who in antiquity were often

believed to be gods, descended from gods, or divinely ordained to lead. Sociologist Weber (1925/1968) proposed that followers' attachment to, and enthusiasm for, seemingly larger-than-life leaders is intensified in times of historical upheaval; and, Becker (1973) argued that devotion to charismatic leaders results from a defensive need to feel one is a part of a larger whole. Initial support for the notion that managing existential terror underlies the allure of charismatic leaders was provided by Cohen, Solomon, Maxfield, Pyszczynski, and Greenberg (2004). After an MS or aversive control induction, participants read snippets of campaign speeches by three hypothetical gubernatorial candidates with varying leadership styles before casting a vote for their favorite. The charismatic candidate emphasized each individual's importance in a great nation: "You are not just an ordinary citizen, you are part of a special state and a special nation and if we work together we can make a difference." The other candidates emphasized completing tasks effectively (task-oriented), or the need for leaders and followers to work together and accept mutual responsibility (relationship-oriented). Findings indicated that while only 4% of the respondents voted for the charismatic candidate in the control condition, 31% of the participants chose the charismatic candidate after an MS induction.

Follow-up studies by Landau et al. (2004) replicated this finding in the context of the 2004 US presidential election, when President George W. Bush, who declared that he believed God had chosen him to rid the world of "evil-doers" in the aftermath of the September 11, 2001 terrorist attacks on the World Trade Center and the Pentagon, ran against Senator John Kerry. Whereas American participants rated Senator Kerry more favorably than President Bush in an aversive control condition, President Bush was rated more favorably than Senator Kerry in response to MS; and, in late September 2004, Cohen, Ogilvie, Solomon, Greenberg, and Pyszczynski (2005) found that while registered voters in an aversive control condition intended to vote for Senator Kerry by a 4:1 margin, other registered voters randomly assigned to a MS condition reported intending to vote for President Bush by a more than 2:1 margin. Similarly, and more recently, Donald Trump was elected president in 2016 by claiming that the United States was under siege by terrorists, Muslims, and immigrants—and that only he could keep US citizens safe by "Making America Great Again." Cohen, Solomon, and Kaplin (2017) found that while American participants in a control condition rated Hillary Clinton significantly more positively than Donald Trump, Trump's ratings increased significantly in response to MS (and were slightly but nonsignificantly higher than ratings of Clinton).

In sum, being part of a great and enduring tribe or nation headed by a fearless and peerless leader clearly serves to boost self-esteem and fosters a secular-based sense of symbolic immortality that dampens the dread of death.

FAME AND FORTUNE

The Epic of Gilgamesh, a Sumerian tale written c.2150–1400 BCE, is thought to be the oldest extant piece of western literature. The epic is noteworthy because it contains themes and events, such as a great flood, that are subsequently repeated in the Old Testament, which is the original basis for all western monotheistic religions. Throughout the story, Gilgamesh, the semi-divine son of the Priest-King Lugalbanda and the goddess Ninsun, is ardently determined to discover a magic potion that would render him immortal, as well as to engage in heroic deeds that "all the world shall know of" to enhance his reputation and "leave behind...an enduring name" (Sandars, 1960/1972, p. 73). In Ancient Greece, as noted in the *Illiad* and the *Odyssey*, war heroes were rewarded with "imperishable fame" (Braudy, 1986, p. 30). The tradition of acquiring fame through heroic accomplishments continued in ancient Rome, where fame seekers had historians and poets with them on military expeditions to chronicle their gallant victories. Eventually, the poets who portrayed the heroic become famous in their own right, and there is no doubt regarding the existential concerns that motivated their artistic pursuits, for example, Horace in *Odes*, 23 BC (Braudy, 1986, p. 115):

> *I have built a monument more lasting than bronze*
> *and higher than the royal palace of the Pyramids....*
> *I shall not totally die and a great part of me*
> *will live beyond Death: I will keep growing, fresh*
> *with the praise of posterity.*

In modernity, people still yearn passionately for fame; and many earn their notoriety via remarkable, and sometimes truly noble and heroic, feats, while others become celebrities: people who are famous because they are known for being known, even if, they have never done anything particularly noteworthy or productive (Rojek, 2001).

Attesting to the current popularity of fame and celebrity, Uhls and Greenfield (2012) found that a desire for fame, solely for the sake of being famous, was the most popular future goal among a group of 10- to 12-year-old Americans. Similarly, in a 2010 poll conducted in the United Kingdom, 1000 16-year-olds, when asked the question "What would you like to do for your career?" 54% answered "Become a celebrity," although 68% reported having no idea of how to become famous and only 19% believed they had the talent to attain their goals (Kershaw, 2017).

If a fervent desire for "imperishable fame" serves a terror management function, then people reminded of their mortality should be, and indeed are, subsequently more eager to become famous. After an MS or intense pain induction, Greenberg, Kosloff, Solomon, Cohen, and Landau (2010) asked participants "How much would you like to become famous?" As predicted,

participants reported a greater desire for fame after pondering their own mortality. In a second study, after writing about death or a neutral topic, participants viewed an advertisement for "YourStar.com," an Internet-based service where people can buy a star to name after themselves. The ad claimed that YourStar.com works with the Universal Star Council to guarantee that each star is permanently registered with only one name, thus ensuring that one "owns" their star for billions of years. In response to the MS induction, people reported greater interest in having a star named after them and were willing pay more to do so. Additional evidence for the death anxiety buffering effects of fame and celebrity is provided by a study demonstrating that people believe that a plane is less likely to crash if a famous person is among the passengers (Kesebir, Chiu, & Kim, 2014).

Another secular worldview, that is, both historically and currently, closely related to and often interconnected with fame, is amassing great fortunes in the form of money and material possessions. In classical economics (see, e.g., G. Becker, 1978), money is typically viewed as an abstract symbol that people rationally employ to exchange goods and services, and material possessions are assumed to be amassed in the service of addressing satiable needs and desires. However, Ernest Becker, in a chapter from *Escape From Evil* (1975) entitled "Money: The New Universal Immortality Ideology," argued that money and "stuff" have always had, and still have, sacred connotations with intimations of immortality, which is why people seem to have an insatiable desire for infinite amounts of both. Money originated in religious rituals. Families in ancient Greece held communal feasts to honor their heroic ancestors, who they believed had the power of immortal gods and could therefore provide protection, advice, and direction. Coins bearing the images of ancestors that were used to gain admittance to the feasts were highly valued because they were believed to have the same magical powers as the ancestors themselves. As anthropologist Roheim (1934, p. 402) put it, "originally people do not desire money because you can buy things for it, but you can buy things for money because people desire it."

Money confers supernatural clout. So does "stuff." For centuries, members of Native American tribes of the Pacific coast from Oregon to Alaska held potlatches on special occasions to display their wealth. Wealthy families, after months or years accumulating excess resources, hosted celebrations that began with dancing, singing, speeches, and feasting. Then for several days, the host showered the guests with an immodest barrage of gifts, including fish, meat, berries, skins, blankets, slaves, and copper shields. Guests were then obligated to hold their own potlatches to reciprocate and escalate the exchange. The primary objective of the potlatch, according to anthropologist Kan (1989, p. 232), "was to create an impression of an endless supply of wealth." And in contemporary society, potlatch-like behavior persists in the form of conspicuous consumption among the rich, and a seemingly

fanatical devotion to shopping among the rest. More Americans shop on Black Friday (the day after Thanksgiving) than who vote in presidential elections. According to one account (www.consumerzone.org, 2001), "On the day after Thanksgiving 1999, the San Antonio Express News reported that thousands of shoppers began lining up outside of WalMarts, Best Buys, and Targets at 2 a.m. for the new 'tradition' of after-Thanksgiving shopping. The newspaper reported that most shoppers said they had no idea what they wanted to buy. They were simply lured out by the promise of sales." Recognizing the role that death-denial plays in acquisitive behavior, Big Daddy in Tennessee Williams' *Cat on a Hot Tin Roof* (1940/2004, p. 91) observed: "The human animal is a beast that dies and if he's got money he buys and buys and buys and I think the reason he buys everything he can buy is that in the back of his mind he has the crazy hope that one of his purchases will be life ever-lasting."

Several lines of research show that Big Daddy was right. High death anxiety is associated with materialism and consumption (see Chapter 21, this volume). In one study (Christopher, Drummond, Jones, Marek, & Therriault, 2006), participants who viewed death most negatively reported being more materialistic than those who viewed death more positively as the natural end to life. Another study (Choi, Kwon, & Lee, 2007) found a significant positive correlation between death anxiety and brand name consumption (i.e., endorsement of: "I try to stick to well-known brand names" and "I prefer to buy products with designer names") and compulsive consumption (i.e., endorsement of: "I frequently buy things even when I can't afford them," "I pretty much spend for today and let tomorrow bring what it will," and "I am an impulse buyer").

These findings have been conceptually replicated and extended experimentally. Mandel and Heine (1999) had participants, after completing a fear of death scale or fear of depression scale, view advertisements for two luxury products, a Lexus automobile and Rolex watch, and two relatively mundane products, a Chevrolet Metro automobile and Pringles potato chips. Participants then rated how effective they found each ad, and their interest in, and likelihood of, buying each product. Those reminded of death found the luxury product ads more effective, and were more eager to purchase a Lexus and Rolex, whereas evaluations of the Metro and the Pringles were unaffected. Additionally, Kasser and Sheldon (2000) predicted and found that in response to MS, participants made higher estimates of their overall worth and greater intended future expenditures on clothing and entertainment. Finally, in a series of studies, Zaleskiewicz, Gasiorowska, Kesebir, Luszczynska, and Pyszczynski (2013) found that participants reminded of their mortality: overestimated the size of coins and monetary notes; reported higher monetary standards for what would define someone as wealthy; and, demanded greater compensation for deferring immediate payment of money. Additionally, just counting a stack of money (relative to counting a stack of paper) resulted in a subsequent reduction of

explicit death anxiety; similarly, Zaleskiewicz, Gasiorowska, and Kesebir (2013) demonstrated that priming participants with the prospect of saving money reduced explicit death anxiety.

ANCESTORS AND CHILDREN: LOOKING BACK (AND) TO THE FUTURE

Another prevalent secular worldview that confers a sense of meaning and value is to view oneself as a temporal representative of a long line of ancestors extending back into the distant past, as well as the parental prelude of future generations extending into the distant future. People take great pride in, and comfort from, their genealogical history. Pharaohs, kings, and emperors often traced their descent from gods. In ancient Rome, family background was of the highest importance. It still is for the Fang of Equatorial Africa, where learning and recitation of one's genealogy is an essential element of the ancestor cult *byeri*, which regulates all aspects of personal and interpersonal behavior (LaGamma, 2007). Americans have been preoccupied with their lineage since the earliest days of the republic, prompting Alexis de Tocqueville's observation in *Democracy in America* (1840/1945, pp. 173–174) that: "There is hardly an American to be met with who does not claim some remote kindred with the first founders of the colonies; and as for the scions of the noble families of England, America seemed to me to be covered with them." Presently, people spend copious amounts of time and money on internet sites such as Ancestry.com, FamilyTreeNow.com, MyHeritage.com, FindMyPast.com, and KinCore.org, trying to flesh out the branches of their family trees.

Ancestors keep the past alive, but more psychologically uplifting perhaps is the knowledge that the chain of being persists over time, hence the enormous importance of children. People can accept their own transience knowing they live on through their children, their children's children, and so on in perpetuity. Children are often named after their parents or other relatives, becoming "namesakes": ambulatory testaments to the existence of those in older generations. And countless parents throughout history have undoubtedly beamed with pride when informed that their child has "his mother's patience and generosity" or "her father's shimmering blue eyes." Besides, or perhaps, beneath the pride, is the great comfort that a part of you is apparently alive and well as you pass the baton to the next generation in the relay race of life, fervently hoping the next "runners" will do their part and keep handing bits of you off to those in future generations. Moreover, because children generally share the same beliefs and values of their ancestral forebears, this serves to fortify parents' confidence in the veracity and temporal durability of their cultural worldviews.

Although there is no research to date examining the role of terror management processes in the veneration of ancestors (presumably death reminders would increase people's interest in their genealogy, and making one's ancestors salient would reduce explicit death anxiety as well as DTA in response to an MS induction), there is both direct and indirect empirical evidence that a desire

for children serves as a defensive reaction to intimations of mortality. In response to MS, Fritsche et al. (2007, Study 1) found that Germans reported an increased desire for children, and intention to have them sooner; and, Wisman and Goldenberg (2005, Studies 1–3) found that Dutch men, but not women, desired more children after MS (see Mathews & Sear, 2008 for a similar finding with UK participants). Wisman and Goldenberg explained this finding by noting that, for many women, having children may be at odds with a career-oriented worldview. Accordingly, Wisman and Goldenberg (2005, Study 4) found that females, after reading a portion of a newspaper article arguing that having children is not incompatible with a successful career, reported desiring more children in response to an MS induction.

Additionally, Zhou, Liu, Chen, and Yu (2008) found that Chinese participants reminded of their mortality were subsequently less supportive of China's birth control policy; the authors interpreted this finding as an implicit desire for more children in order to buffer death anxiety. Fritsche et al. (2007, Study 3) found that East Germans asked to write about having children someday were significantly less likely to derogate West Germans in response to a death reminder. This result suggests that just thinking about having children provided a potent shield from existential anxiety. Finally, Vicary (2011) asked participants to write about their own death or a control topic, and then had them imagine that they would have a same-gendered child in the future. Participants reminded of their mortality were significantly more likely to report that they would name the child after themselves.

SECULAR POTPOURRI

In principle, there are innumerable secular worldviews that can serve a terror management function. Worldviews, according to psychiatrist Wheelis (1980, p. 72), "may be as large as Christianity or as small as the Alameda County Bowling League"—as long as they provide their adherents with a compelling sense of meaning and value. Sports fans, for example, are notoriously devoted to their teams, often deeming them to be more important than their national and/or religious affiliations. Indeed, more than 100 million Americans watch the Super Bowl every year (where, besides cheering for their favorite team, they also take pride in gorging themselves on their favorite food and beverages, as well as enjoying their favorite commercials and halftime entertainment); and, more than 3.2 billion people around the world watched the 2014 World Cup. That a partisan preference for sports teams is a viable secular worldview was documented in two studies by Dechesne, Greenberg, Arndt, and Schimel (2000). In the first study, Dutch participants reminded of their mortality expressed greater optimism that the Netherlands would prevail in their next soccer match against arch-rival Germany. This finding was then replicated and extended in Study 2 with fans of the University of Arizona football and basketball teams; specifically, death

reminders increased identification with, and optimism regarding future success of, their teams (although this effect was obtained only if the team in question had not lost their most recent game).

Another popular secular pursuit is immersion in music, be it a particular genre (e.g., country, classical, reggae, blues, heavy metal), or specific artists (e.g., Grateful Dead, Phish, Rush, Michael Jackson, Madonna). Music aficionados see themselves as members of a distinct culture, with certain kinds of clothing, refreshments (food, drink, drugs), ritual activities before, during, and after performances, and political and philosophical ideologies associated the music and/or musicians. For some people, music is a central component of their personal identity and their view of the world (Weinstein, 1991), and as such, a viable means of buffering existential terror. To test this notion directly, Kneer and Rieger (2016) had heavy metal fans, after an MS or control induction, listen to either a popular heavy metal song or 3 minutes from an audio book, followed by an assessment of cultural worldview defense. In accord with their predictions, while participants who listened to the audio book showed the typical cultural worldview defense in response to MS, this effect was eliminated for participants who listened to a popular heavy metal song. In a second study, metal fans and nonfans, after an MS or control induction, listened to a popular heavy metal song or 3 minutes from an audio book, followed by an assessment of implicit self-esteem. Consistent with the findings of Study 1, metal fans who listened to the audio book and nonfans who listened to either the audio book or the heavy metal song showed increased implicit self-esteem in response to MS; this effect was, however, eliminated when metal fans listened to metal music.

Partisan political affiliations are also secular worldviews that function as a bulwark against existential terror. To corroborate this notion empirically, McGregor et al. (1998) conducted an experiment described as a study of food preferences, where after a reminder of their own mortality or an upcoming exam, extremely liberal or extremely conservative students believed they were administering hot sauce to either another extremely liberal or extremely conservative participant who was not fond of spicy foods. Participants were instructed to taste a sample of the hot sauce, place as much or as little of it as they wanted in a cup, and that the recipient would have to consume all of it. Given that participants believed the recipient did not like spicy foods, and yet had to consume all of the hot sauce, McGregor et al. assumed larger allocations would be thinly veiled acts of aggression. Results indicated that participants reminded of an exam doled out a modest dose of hot sauce to those with similar and dissimilar political views. And after a reminder of death, conservatives were similarly restrained for a fellow conservative, while liberals were restrained for fellow liberals. However, conservatives reminded of death walloped liberals with a double dose of hot sauce, and liberals did the same to conservatives. So much for compassionate conservatives and liberal pacifists when the specter of death is brought to mind!

There are surely other viable secular worldviews that serve to buffer existential anxieties. Passionate devotion to various contemporary lifestyles is one category of such worldviews, including yoga, diet (e.g., vegetarians, vegans, raw food, paleo), meditation, and extreme fitness (e.g., marathons, iron man and iron woman, hardcore parkour). Pet owners, pet lovers, and pet trainers also fit the bill; so do avid collectors in diligent pursuit of everything from classic cars to coins, stamps, baseball cards, dolls, and fine arts. Similarly, ardent commitments to various social causes from environmental protection to animal rights on the left to right to life and National Rifle Association on the right are central elements of some people's view of the world.

ATHEISM

In *God Is Not Great: How Religion Poisons Everything*, Hitchens (2007) wrote about his personal transformation from a religious childhood to an atheistic secular view of life based on science and reason. For Hitchens and like-minded thinkers (e.g., Sam Harris, Richard Dawkins, and Daniel Dennett), whereas religious worldviews are death-denying obfuscations of reality, atheism is the only worldview that can result from a veridical assessment of reality. However, somewhat ironically perhaps, evidence suggests that atheism, regardless of the merits of atheists' claims that gods do not exist, is itself a secular belief system with the same terror management functions of religious and other secular worldviews. Specifically, Jong, Halberstadt, and Bluemke (2012) found that in response to MS, religious participants became more confident in the existence of supernatural entities, while atheists became more confident that such entities did not exist. In a second study, however, Jong et al. (2012) found that MS increased implicit belief in supernatural entities in both religious participants and atheists, suggesting that atheists may harbor some hopes, albeit unconsciously, of transcending death. Moreover, Hayes et al. (2015, Study 1) had atheists read either an essay that argued persuasively that the theory of evolution cannot account for the origin of life on earth, and that the universe must have been designed and created by some intelligent entity (i.e., god), or a neutral essay that posed no threat to an atheistic worldview. All participants then completed a word-stem completion task to measure DTA. In accord with the authors' predictions, atheists had higher DTA after reading a cogent argument for a theistic conception of the origin of life. The results of these studies provide convergent support for the proposition that atheism, like religion, serves as a death-denying belief system for its adherents.

PROGRESS: THE ULTIMATE SECULAR WORLDVIEW OF MODERNITY

The Enlightenment, also known as The Age of Reason, originated in Europe in the 18th century. It was based on the assumption that reason and science

were vastly superior to orthodox religious beliefs for improving the human condition, and that the stunning advances of knowledge derived from the Scientific Revolution and resultant technological innovations of the Industrial Revolution would inevitably continue unabated on an inexorable path of progress culminating in conditions on earth comparable to those generally purported to exist in heaven. At the end of the 18th century, Ben Franklin expressed regret that he had been born too soon to witness extraordinary progress in agricultural production, levitation as a means of transportation, and the cure or prevention of all diseases, including old age. "For noble deeds grant scope abounding," Goethe wrote in his 1790 version of *Faust*, "I sense accomplishments astounding," and his last word prior to his death in 1832 was reputedly "Progress" (May, 1991, pp. 248, 255).

Unbridled faith in the inevitability of progress via reason and science continued in the 20th century, either in the form of Marx's revolutionary socialism promising to eliminate poverty by disposing of private property and class conflicts, or global capitalism's mission to parlay the "invisible hand" of the marketplace into a rising tide of shared prosperity culminating in "The End of History" (Fukuyama, 1992) with Western democracy as the final and ultimate form of government for all nations.

The Enlightenment belief in progress has surely increased scientific knowledge and will continue to do so; and, this in turn has undoubtedly been beneficial to a large proportion of humanity. However, according to philosopher John Gray, the belief that progress is inevitable and that advances in scientific knowledge are always advantageous is based on wishful thinking to ward off death anxiety: "Late modern cultures are haunted by the dream that new technologies will conjure away the immemorial evils of human life. But no new technology can abolish scarcity, do away with the necessity of choice or alter the fact of human mortality" (Gray, 2004, p. 22). Gray argues that belief in progress is a secular worldview derived from Christianity in that it promises salvation as the end of history and, as such, serves to manage existential terror, just like religious beliefs. However, while religious worldviews provide hope of literal immortality through souls, heavens, reincarnations, and afterlives, secular worldviews based on faith in progress strive for literal immortality through scientific efforts to prevent people from ever dying, or if they do die, to resuscitate them literally or virtually. In the Soviet Union, The Immortalization Commission was charged with preserving Lenin's remains until scientific efforts to render death obsolete could be discovered (Gray, 2011). Concurrently, the cryonics movement was spawned in the United States with the same goal: to reverse the effects of illness or death, either through resuscitation or by (eventually) moving one's "soul" (i.e., identity; consciousness) from a corporeal and-thus-mortal body to an infinitely more enduring silicon-based medium such as a computer cloud (Bainbridge, 2004).

To demonstrate that belief or faith in progress serves a terror management function, Rutjens, van der Pligt, and van Harreveld (2009) predicted

and found that, in response to an MS induction, participants reported great disagreement with an essay proposing that human progress is illusory (including statements such as "I think progress is definitely an illusion. We always seem to focus on progress in science and technology, but meanwhile there still exist wars and conflicts in the world. There's plenty of evidence that we haven't witnessed any real progress since the Middle Ages..."); and, a subsequent study found that reading the same essay declaring progress as illusory was sufficient to increase DTA. Finally, Study 3 showed that reading an essay bolstering belief in progress subsequently eliminated cultural worldview defense in response to an MS induction.

SUMMARY AND CONCLUSION

> *For many, the promises of religion lack credibility; but the fear that inspires them has not gone away...*
>
> John Gray, *Heresies: Against Progress and Other Illusions*

When Ernest Becker argued in *The Denial of Death* that humans manage the existential terror engendered by death awareness by embracing cultural worldviews to afford a sense of meaning and value in order to transcend death, many readers found his arguments to be a plausible account of religious worldviews, given the explicit promise of literal immortality that is generally associated with them. However, Becker, even in his earliest works (see, e.g., *The Birth and Death of Meaning*, 1971), was quite explicit in his insistence that secular worldviews are also routinely employed by the human animal, both in conjunction with religious worldviews and in their own right, in order to ward off death anxiety, primarily by providing a variety of opportunities to procure symbolic immortality. Following Becker, TMT postulates, and the research summarized in this chapter confirms, that secular worldviews, including but not confined to—nationalism and support for charismatic leaders, fame and money and material possessions, devotion to ancestors and desire for children, hobbies and lifestyles and political predilections, atheism, and faith in the inevitability of progress—serve the same terror management functions as religious worldviews.

This raises important questions about the relative costs and benefits of secular versus religious worldviews. Becker (1971, 1973; see, also Vail et al., 2010) argued that religious worldviews may be more effective than secular worldviews for mitigating death anxiety for two reasons. First, as Woody Allen famously declared, "I don't want to achieve immortality through my work. I want to achieve it through not dying" (Allen & Sunshine, 1993, p. 250). The fact that religious worldviews almost invariably offer some form of literal immortality makes them potentially more attractive to their adherents than the relatively less certain and less eternal forms of symbolic immortality that are characteristic of secular worldviews. Second, because religious worldviews are based on devotion to invisible and often

ineffable supernatural entities, they are less subject to rebuttal and refutation on logical and empirical grounds, relative to secular worldviews which are generally grounded in physical reality and thus in principle easier to disconfirm by facts and actual events.

Conversely, secular worldviews are sometimes lauded as superior to religious ones in that religious motivations are often identified as the underlying cause for protracted hatred toward others and genocidal wars to destroy the infidels and purify the world on God's behalf (Dawkins, 2006). The Crusades and the Inquisition are well-known examples of Christian iniquity in this regard. However, by far the most heinous carnage in the 20th century was the product of Hitler's and Stalin's and Mao's unabashedly secular worldviews.

Perhaps then, rather than comparing the intrinsic merits of secular worldviews relative to religious worldviews, all cultural worldviews should be evaluated in terms of the extent to which each provides a compelling sense of meaning and value to its' adherents, without undue harm to other people, to other creatures, and to the planet upon which our survival depends. Or as Ernest Becker noted (1973, p. 158), the question then becomes, "What is life-enhancing illusion?"

In this regard, Solomon, Greenberg, and Pyszczynski (2015) make a distinction between two kinds of cultural worldviews: the "rock" and the "hard place." "Rock" worldviews, such as Christian Fundamentalism, Sharia Law, and free market capitalism, offer clear and comprehensive accounts of the universe with explicit prescriptions for how one must behave in order to obtain literal and/or symbolic immortality. Such worldviews, by providing unambiguous bases of meaning, self-worth and immortality, afford potent psychological security for their adherents. However, rock worldviews often stand in explicit opposition to alternative cultural worldviews (e.g., Islam for Christian Fundamentalists; Christians for Muslims who subscribe to Sharia Law; socialists for Ayn Rand-ish capitalists who pledge allegiance to the "magic of the marketplace") and therefore tend to foster an "us = good" versus "them = evil" mentality that leads to prejudice, intolerance, and strife.

"Hard place" worldviews, alternatively, such as some forms of Buddhism and secular humanism, offer more malleable conceptions of life that accept ambiguity and thus generally entail accepting some degree of uncertainty. Adherents of such views tend to more ecumenical and tolerant of people who are different than religious and secular fundamentalists, although they may also suffer from persistent (albeit not always conscious) anxiety that fosters self-medication via drugs and alcohol and self-indulgence via compulsive shopping and fleeting devotion to spiritual fads.

Given that the existential terror that underlies the development and maintenance of cultural worldviews is unlikely to abate in the foreseeable future, cultivating viable worldviews that combine the best of the "rock" and the "hard place" should rank very high on humankind's to-do list, lest we earn the ignominious distinction of being the first form of life directly responsible for its own extinction.

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Chapter 13

Terror Management Theory: A Theory of Psychological Well-Being

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As evidenced by the many chapters in this volume, research derived from terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) has illustrated that the awareness of death is a motivational force underlying several social phenomena (e.g., prejudice, intergroup conflict, terrorism, aggression, and prosocial behavior; Greenberg, Solomon, & Arndt, 2008; Vail, Juhl, et al., 2012). As such, the theory is largely, and perhaps primarily, considered to be a core social psychological theory (van Lange, Kruglanski, & Higgins, 2011). However, TMT, in its scientific breadth, is also a theory about psychological well-being. It outlines conditions necessary for the maintenance of psychological well-being and it explicates why these conditions are necessary. Specifically, the theory asserts that in order to prevent the awareness of death from causing anxiety and compromising psychological well-being, humans need a properly functioning anxiety buffer system that provides a sense of self-worth and meaning in life.

Research supporting the application of TMT to psychological well-being suggests that psychopathology results, in part, from the breakdown of typical anxiety buffers (for reviews, see Arndt, Routledge, Cox, & Goldenberg, 2005; Pyszczynski & Taylor, 2016). This breakdown consequently leads to abnormal or maladaptive strategies for managing anxiety (e.g., compulsive washing; Strachan et al., 2007). However, despite the fact that TMT is a theory about well-being, relatively little attention has been paid to direct assessments of psychological well-being. According to the theory, the awareness of death should lead to anxiety and adversely affect psychological well-being in the absence of self-worth and meaning. Thus, to thoroughly scrutinize the theory, it is valuable for research to directly examine whether death

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awareness instigates anxiety and negatively affects well-being when there are lapses in the anxiety buffer system that leave individuals lacking self-worth and meaning. Fortunately, emerging research has begun to tackle this initiative. Results thus far have supported the theory and helped solidify its contribution to the psychological well-being literature.

My purpose in this chapter is to discuss TMT's claims about well-being, highlight emerging research testing these claims, and integrate this within the broader terror management literature. More specifically, I first present TMT as a theory about psychological well-being. Then, I detail research investigating whether the awareness of death causes anxiety and compromises well-being when adequate anxiety buffers are not in place. I then consider the nuances of these effects, discussing how conscious and unconscious activation of death thoughts bring about such aversive psychological consequences. Lastly, I consider how the negative affective states that the awareness of death arouses may relate to the strategies that people use to manage both conscious and unconscious activation of death thoughts.

A THEORY OF PSYCHOLOGICAL WELL-BEING

TMT has roots in several lines of scholarship, including evolutionary theory (Darwin, 1859; see Landau, Solomon, Pyszczynski, & Greenberg, 2007), cultural anthropology (Becker, 1973), and philosophy (Kierkegaard, 1843/1955). Importantly, the theory is also founded upon the work of psychoanalysts and clinical theorists, most notably Yalom (1980), Rank (1936/1945), and Lifton (1979/1983). Together, these roots shape the theory's capacity to understand the conditions necessary for humans to maintain psychological well-being.

TMT first takes note of humans' evolutionary predisposed motive to protect and continue their life in the service of gene replication. Akin to all living organisms, humans have met this end via evolved adaptations that aid survival in their external environment. One such adaptation is the basic emotion of fear, which drives people to avoid situations that pose threats to their life. Another adaptation, which is more unique to humans, is their astute cognitive abilities. These abilities have certainly helped solve adaptive challenges and meet basic survival needs. Indeed, they have even afforded humans the capacity to live and survive in the most barren climates, including Antarctica and outer space.

While this cognitive proficiency has helped humans overcome several external adaptive challenges in the environment, it created an internal adaptive challenge that also needed to be solved (Landau et al., 2007; Pyszczynski, Solomon, & Greenberg, 2015). An internal adaptive challenge is a challenge created when an evolved adaptation (e.g., larger bone)—although beneficial in its own right—creates a new adaptive challenge (e.g., extra weight; Tooby & Cosmides, 1992). The internal challenge is then

solved with further adaptations (e.g., stronger muscles). In other words, an internal challenge is when the organism needs to adapt to changes that are internal to the organism, as opposed to adapting to the external environment. Humans' powerful cognitive capacity presented an internal adaptive challenge because it rendered them smart enough to be aware of their own death. Moreover, they are not only aware of death's certainty, they are aware that death can come at any time, for reasons that are out of their control and their ability to predict. This acute awareness of death posed a challenge to humans because it runs counter to their desire to protect and continue their life. Humans' motive for continued life (including fear of that which threatens their life) juxtaposed with their awareness that death may be around every corner should result in constant anxiety about death. While anxiety and fear in response to immediate life threats is certainly still adaptive for humans, constant preoccupation with, and anxiety about, the ever present threat of death is not adaptive. Thus, in order to maintain psychological equanimity, it is necessary for humans to have adapted a means to circumvent anxious preoccupation with death. That is, it is necessary for humans to have an anxiety buffer system.

According to the theory, the anxiety buffer system keeps death anxiety at bay by providing individuals with perceptions that their life has worth (i.e., significance, value, purpose, meaning) that goes beyond that of their dying, physical self. That is, if individuals can feel that their life has value, meaning, or purpose that transcends that of their relatively temporary physical self, then they can live alongside their awareness of death with relative psychological equanimity. The theory heavily emphasizes the role of cultural worldviews in the anxiety buffer system because they provide the foundation for individuals' sense of worth (Solomon, Greenberg, Schimel, Arndt, & Pyszczynski, 2004). Cultural worldviews are socially constructed and validated beliefs about the nature of reality. They give the world a sense of meaning, providing, for example, an explanation of the universe's origins. Importantly, cultural worldviews provide people with direction in determining what behavior and attitudes are valued—stated differently, cultural worldviews provide standards of self-worth. Individuals who perceive that they are living up to their worldview's standards are able to possess a sense that their life does have enduring worth.

In short, TMT helps understand psychological well-being by (1) describing conditions necessary for maintaining psychological well-being and (2) explicating why these conditions are necessary. In particular, the theory states that (1) it is necessary to have beliefs in a meaningful worldview and perceptions of self-worth and meaning (2) because they prevent the awareness of death from causing anxiety and undermining psychological well-being.

A good portion of research supporting the theory has demonstrated that experimentally heightening the awareness of death (termed "mortality

salience"; see Chapters 1 and 4, this volume) elevates individuals' defense of their cultural worldviews and augments individuals' efforts to live up to their worldview's standards of self-worth (for reviews, see Greenberg et al., 2008; Pyszczynksi, Greenberg, Solomon, Arndt, & Schimel, 2004). This research has showcased the greatly diverse ways in which individuals—with varying personalities, from different (sub)cultures, and in various circumstances—manage concerns about death. Other research supporting the theory has come from studies showing that experimentally threatening aspects of individuals' worldviews and self-worth increases the accessibility of death thoughts within individuals' minds (for a review, see Hayes, Schimel, Arndt, & Faucher, 2010). That is, undermining structures that keep death concerns at bay increases the likelihood that people will think about death. While this work has provided vital evidence for the theory, it has not tested the theory's claims about psychological well-being.

Research has, however, implicated the theory in the development of psychological health problems. Following directly from the theory, this work conceptualizes psychopathology as a breakdown in the typical anxiety buffers, such as faith in one's cultural worldview (see Chapter 19, this volume). This breakdown then leads to abnormal and maladaptive strategies for managing existential concerns with death (Yalom, 1980). As stated by Arndt et al. (2005), "psychologically problematic behaviors may manifest when existential anxiety can no longer be effectively kept at bay through the more typical avenues of psychological defense," (p. 192). If psychopathological behaviors represent maladaptive means of managing death concerns, then making mortality salient should increase such behaviors for individuals with relevant pathologies. Indeed, mortality salience (vs control) lengthens the time that individuals with obsessive compulsive tendencies spend washing their hands and exacerbates the avoidance of spiders for individuals with arachnophobia (Strachan et al., 2007). Similar work suggests that disassociation and posttraumatic stress disorder are due to the deterioration of one's worldview beliefs (Pyszczynski & Taylor, 2016).

This research is illustrative of TMT's capacity to understand psychological well-being. In particular, it helps illuminate the etiology of psychological disorders (Arndt et al., 2005). However, this line of work has left some of the theory's central claims about well-being untested. According to the theory, the anxiety buffer system, which ultimately fosters a sense of self-worth and meaning, is an adaptation that prevents the awareness of death from causing anxiety. In other words, in the absence of such an adaptation that affords humans the capacity to see their lives as having broader significance, the awareness of death should result in anxiety and have negative effects on psychological well-being. While TMT outlines solid theoretical grounds for this assertion, what evidence is there that humans' awareness of death is so psychologically problematic that it warrants an anxiety buffer system? Psychologists have

stressed the lack of such evidence (DeWall & Baumeister, 2007; Martin & van den Bos, 2014; Lambert et al., 2014) and have accordingly held their reservations about the theory (Martin & van den Bos, 2014). However, a careful look at the (mostly recent) terror management literature reveals several studies that directly test and support these basic tenets of the theory.

EVIDENCE FOR TMT'S CENTRAL CLAIMS ABOUT WELL-BEING

Again, TMT states that death awareness should lead to anxiety and undermine well-being in the absence of a properly functioning anxiety buffer system that fosters a sense of self-worth and meaning in life. To directly test this, my colleagues and I have conducted a series of investigations in which we have examined anxiety and well-being as outcomes of death awareness and individuals' levels of self-worth or meaning. Specifically, in these studies, we have first measured trait levels of self-worth, meaning in life, or traits that foster self-worth and meaning in life. Next, we have experimentally heightened the awareness of death (i.e., mortality salience). Finally, we have measured anxiety or other indicators of psychological well-being. If the theory's claims about well-being are correct, then mortality salience should increase anxiety and undermine well-being, but only for those who lack perceptions of meaning in life or self-worth. In what follows, I review this research in detail. I structure this review around the various traits (i.e., meaning in life, nostalgia proneness, personal need for structure, interdependent self-construal, self-worth) we have examined that should buffer the effect of death awareness on anxiety and well-being.

Meaning in Life

In an initial investigation, we examined the effects of mortality salience on death anxiety among individuals who varied in trait levels of meaning in life (Routledge & Juhl, 2010). According to TMT, possessing the sense that one's life has meaning, or that life in general is meaningful, should allow individuals to walk alongside their awareness of death without constantly fearing it (see Chapter 15, this volume). As such, we hypothesized that mortality salience would increase death anxiety only for individuals who have relatively low levels of meaning in life and not for individuals who have relatively high levels of meaning in life.

To test this hypothesis, we first asked participants to complete Ryff's (1989) meaning in life scale. This scale assesses meaning in life with items such as, "My personal existence is purposeful and meaningful." Next, we randomly assigned participants to a mortality salience condition or a control condition extensively used in previous research (see Chapter 4, this volume). Those in the mortality salience condition answered two open-ended questions about death. Specifically, we instructed them to "Briefly describe the

emotions that the thought of your own death arouses in you," and to "Jot down, as specifically as you can, what you think will happen to you physically as you die and once you are physically dead." In the control condition, participants responded to parallel instructions about failing an important exam, instead of death. Finally, we asked participants to complete the Death of Self subscale of the Revised Collett–Lester Fear of Death Scale (Lester, 1990). This scale asks participants how anxious they are about various aspects of death (e.g., "never thinking or experiencing anything again").

Results demonstrated that among participants with low levels of meaning in life, those in the mortality salience condition evidenced higher death anxiety than those in the control condition. Among those with high levels of meaning in life, there was no difference between the two conditions. In short, mortality salience increased death anxiety among individuals with low, but not high, perceptions of meaning in life. This study revealed that the awareness of death does result in anxiety about death for those lacking a sense that their existence is meaningful.

Nostalgia Proneness

In another study, we similarly examined the effects of mortality salience on death anxiety for individuals with varying levels of nostalgia proneness (Juhl, Routledge, Arndt, Sedikides, & Wildschut, 2010; Study 2). Nostalgia is "a sentimental longing or wistful affection for the past" (The New Oxford Dictionary of English, 1998, p. 1266). Studies have shown that nostalgia gives people a sense that their life is meaningful (Routledge et al., 2011; Routledge, Wildschut, Sedikides, Juhl, & Arndt, 2012). Further work suggests that nostalgia plays a role in keeping people from being preoccupied with death thoughts (see Chapter 8, this volume). For example, nostalgia reduces prolonged accessibility of death-related thoughts after a mortality salience induction (Routledge, Arndt, Sedikides, & Wildschut, 2008). We (Juhl et al., 2010) thus hypothesized that mortality salience would increase death anxiety, but only for individuals who are not particularly nostalgia prone.

As a means to examine this, we (Juhl et al., 2010) first administered the Southampton Nostalgia Proneness Scale (Routledge et al., 2008). This scales measures participants' tendency to experience nostalgia with items such as "How often do you experience nostalgia?" Following the completion of this scale, we randomly assigned participants to a mortality salience condition or control condition, as previously described. However, in this study, participants in the control condition wrote about their thoughts and feelings concerning physical pain. Finally, we again measured death anxiety with the Death of Self subscale of the Revised Collett–Lester Fear of Death Scale (Lester, 1990).

Consistent with our hypothesis, mortality salience increased death anxiety for those who scored low on nostalgia proneness. Mortality salience had no effect for highly nostalgic individuals. In short, mortality salience led to death anxiety for those not protected with the meaning-providing trait of nostalgia proneness. This further supports TMT's assertion that the awareness of death can cause anxiety in the absence of proper anxiety buffering structures.

Personal Need for Structure

In another similar study, we examined the effects of mortality salience on death anxiety for individuals with varying levels of personal need for structure (Routledge, Juhl, & Vess, 2013). Personal need for structure refers to the extent to which people desire to see the world as a clearly structured and coherent place (Neuberg & Newsom, 1993). Personal need for structure does not directly reflect individuals' sense of self-worth or meaning. However, individuals with a high personal need for structure are the ones who cling most tightly to mainstream cultural worldviews as a means to provide comfort from death concerns (Juhl & Routledge, 2010). Those with a low personal need for structure, on the other hand, are more likely to manage death awareness by exploring novel ideas and being creative (Routledge & Juhl, 2012; Routledge, Juhl, & Vess, 2010; Vess, Routledge, Landau, & Arndt, 2009). Additionally, research has illustrated that after mortality salience, individuals with a high personal need for structure evidence greater meaning in life than those with low personal need for structure, presumably because they cling to ready-made cultural structures for psychological comfort (Vess et al., 2009). Conversely, individuals with a low personal need for structure need to have an opportunity to explore novel ideas in order to maintain perceptions of meaning after mortality salience. Thus, in the absence of such an opportunity, those with a low personal need for structure should be left vulnerable to experiencing death anxiety when the awareness of death is heightened.

We (Routledge et al., 2013) investigated this hypothesis in a study in which we first administered the Personal Need for Structure Scale (Thompson, Naccarato, Parker, & Moskowitz, 2001). This scale assesses personal need for structure with items such as "I like having a clear and structured mode of life." Next, we randomly assigned participants to a mortality salience or control (exam failure) condition. Finally, we administered the Death of Self subscale of Revised Collett–Lester Fear of Death Scale (Lester, 1990).

Results revealed that mortality salience increased death anxiety for those with a low personal need for structure, but not for those with a high personal need for structure. In other words, mortality salience increased death anxiety for individuals who do not readily respond to death thoughts by investing in existing meaning-providing cultural structures.

Interdependent Self-Construal

The three studies reviewed thus far provide sound evidence for the assertion that the awareness of death causes anxiety in the absence of a sense of meaning, or traits that support a sense of meaning. However, in a further set of studies we examined the effects of death awareness on both anxiety and another indicator of well-being for individuals with varying levels of interdependent self-construal (Juhl & Routledge, 2014a, 2015). Interdependent self-construal refers to defining the self in terms of broader social groups (Markus & Kitayama, 1991). Theorists have reasoned that identifying with social groups aids terror management efforts because groups are larger, more significant, and more enduring than individuals (Becker, 1975; Lifton, 1968). When individuals define themselves in terms of social groups, they can gain the sense of endurance and significance of their groups. In this way, construing the self at the group level can provide individuals with a broader sense of worth. Supporting these claims, several studies have found that when mortality is salient, individuals' identification with their social groups becomes stronger (Castano, Yzerbyt, & Paladino, 2004). On this basis, we hypothesized that heightening the awareness of death should increase anxiety for those not protected with a broader social self-definition. We examined this hypothesis in two studies (Juhl & Routledge, 2014a).

In the first study, we began by administering the interdependent subscale of the Self-Construal Scale (Singelis, 1994). This scale assesses the extent to which individuals define themselves in terms of their social groups with items such as "It is important to me to respect decisions made by the group." We then randomly assigned participants to a mortality salience or control (exam failure) condition, and we subsequently measured death anxiety (Lester, 1990). As hypothesized, we found that mortality salience increased death anxiety for individuals with low, but not high, interdependent self-construal.

In the second study, we examined the conceptual replicability of this finding using the same method, but with two exceptions. First, instead of assigning participants to write about failing an exam in the control condition, we assigned them to write about physical pain. Second, in the previous study (and in all studies that I have detailed thus far), we measured anxiety that was specific to death. In this study, we measured generalized anxiety using the state version of the State–Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970). This scale assesses participants' present feelings of anxiety with statements such as "I feel anxious." We found that mortality salience increased anxiety, but only for those with a low, not high, interdependent self-construal. These two studies illustrated that the awareness of death results in anxiety for those not secured with an enduring social self.

While investigating interdependent self-construal, we additionally tested whether death awareness adversely affects psychological well-being, beyond

arousing anxiety (Juhl & Routledge, 2015). In particular, we examined subjective vitality. Subjective vitality refers to feelings of "aliveness and energy" (Ryan & Frederick, 1997, p. 529) and is an important indicator of overall psychological well-being (Ryan & Deci, 2001; Ryff, 1989). As before, we measured interdependent self-construal and then randomly assigned participants to a mortality salience or control (physical pain) condition. Lastly, we had participants complete the state version of the Subjective Vitality Scale (Ryan & Frederick, 1997), for which participants responded to statements such as "At this moment, I feel alive and vital," and "I am looking forward to each new day." We observed that mortality salience decreased subjective vitality for those with low levels of interdependent self-construal, but not those with high levels of interdependent self-construal. Consistent with the previous studies, this demonstrated that the awareness of death undermines psychological well-being for those lacking the protection of a broader social self-definition.

Self-Worth

Finally, in an additional set of studies, we investigated the effects of death awareness on well-being at varying levels of self-worth (Routledge et al., 2010). Following directly from TMT, we hypothesized that heightening death awareness would adversely affect well-being for those with low self-worth. We tested this hypothesis in two studies.

In one study, we began by measuring self-worth with the Rosenberg Self-Esteem Scale (Rosenberg, 1965). This scale measures self-worth with items such as "I feel that I'm a person of worth, at least on an equal basis with others." Following this, we randomly assigned participants to a mortality salience or control (dental pain) condition. Finally, we measured state levels of subjective vitality (Ryan & Frederick, 1997). We found that mortality salience reduced subjective vitality for individuals with low, but not high, self-worth.

The second study was identical to the first, with two exceptions. First, the control condition concerned failing an important exam, instead of dental pain. Second, and more importantly, we measured a different aspect of psychological well-being. Specifically, we measured satisfaction with life, a central feature of overall psychological well-being (Diener, Emmons, Larsen, & Griffin, 1985; Sheldon, 2016). We measured this with the Satisfaction With Life Scale (Diener et al., 1985), which utilizes items such as "I am satisfied with life." We found that mortality salience decreased satisfaction with life, but only for those with low, but not high, self-worth. Together, these studies confirmed that the awareness of death negatively affects psychological well-being in the absence of self-worth.

Summary

The research reviewed thus far provides sound evidence for TMT's core claims about well-being. As previously mentioned, TMT makes claims about (1) what is necessary to maintain well-being (i.e., self-worth and meaning in life) and (2) why it is necessary (i.e., because the awareness of death would otherwise cause anxiety). While the studies I have reviewed thus far support both of these claims, they have supplied stronger evidence for the latter. Specifically, they provide stronger evidence for the causal effect that death awareness has on anxiety and well-being in the absence of proper anxiety buffers that foster self-worth and meaning. This is because the awareness of death was experimentally manipulated in our research. In particular, compared to those in control conditions, those who were asked to think about death displayed greater anxiety and deficits in well-being if they lacked meaning in life, self-worth, or traits that support meaning and self-worth. This evidence for the negative causal effect of death awareness on well-being is important because it supports the assertion that death awareness did pose an internal adaptive challenge, and that it is necessary for humans to have adapted a means to manage the consequences of death awareness that would otherwise occur.

The reviewed research also supplies evidence for the theory's claims about what is necessary to maintain well-being—i.e., what is necessary to manage the awareness of death. Specifically, the theory stipulates that a sense of meaning in life and self-worth are needed to maintain psychological equanimity in the face of death awareness. Consistent with this, our studies found that those who possess self-worth and meaning in life (or traits that support self-worth and meaning) were unaffected by heightened death awareness. That is, thinking about death did not increase these individuals' levels of anxiety or undermine their well-being. Our capacity to make strong causal claims about the anxiety buffering role of self-worth and meaning in life is tempered by the fact that we measured, instead of manipulated, participants' levels of meaning and self-worth. Nevertheless, the results support the notion that having the sense that one's life has worth and meaning buffers the negative effect of death awareness on well-being.

IMPORTANT NUANCES AND FURTHER EVIDENCE

Beyond the above reviewed program of research, there is additional evidence that the awareness of death can arouse aversive psychological states. In order to discuss this evidence, it is important to first consider an important nuance in the terror management literature.

Proximal and Distal Terror Management Strategies

Research has revealed that people use two different types of terror management strategies to keep death concerns at bay (see Chapter 2, this volume). Efforts to manage concerns about death by bolstering one's sense of meaning and self-worth (as I have previously outlined) are referred to as *distal strategies*. The other type, which I have not yet discussed, are referred to as *proximal strategies*. The extent to which death thoughts are activated within individuals' conscious attention determines whether individuals deploy distal or proximal strategies.

Proximal strategies occur when death thoughts are in individuals' conscious attention. Operationally speaking, they occur immediately after explicit reminders of death—i.e., when there are no tasks between the mortality salience induction and the primary outcome measure. Proximal strategies reflect efforts to manage conscious death thoughts via relatively direct ways of coping with the problem of death. For example, studies have observed that immediately after the mortality salience induction, people try to suppress death thoughts (Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997), try to deny their physical vulnerability to death (Greenberg, Arndt, Simon, Pyszczynski, & Solomon, 2000), or try to conquer their physical vulnerabilities via increased health intentions (Arndt, Schimel, & Goldenberg, 2003). There is some research that even suggests that people unconsciously tune to positive information as a way to automatically cope with threatening death thoughts sitting in the center of attention (DeWall & Baumeister, 2007).

Distal effects, on the other hand, occur when death thoughts are no longer in the center of conscious attention, but are still highly accessible to individuals' conscious stream of thought. Operationally speaking, distal strategies occur when there is a filler task between the mortality salience induction and the primary outcome measure. Distal strategies reflect participants' efforts to attain a broader sense of self-worth or meaning in life. For example, it is when there is a delay after the mortality salience induction that mortality salience increases individuals' defense of their cultural worldviews (e.g., Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994) and bolsters their strivings for self-worth (Taubman Ben-Ari, Florian, & Mikulincer, 1999).

In the studies that I detailed earlier (demonstrating that mortality salience leads to anxiety and compromises well-being for individuals with low meaning and self-worth), we measured anxiety and well-being distally (i.e., after a filler task). However, research has also examined anxiety and well-being proximally. Initially, this research revealed little evidence that mortality salience had a proximal effect on well-being outcomes. However, there were important limitations of this work; and a recent thorough investigation of the literature and a new set of studies have shown that mortality salience does undermine well-being proximally (Lambert et al., 2014).

Proximal Effects on Well-Being

Initial lack of proximal effects. As I mentioned at the onset, the terror management literature has paid relatively little attention to measures of anxiety and well-being. Despite this shortage of attention, over 100 studies have actually measured positive and negative affect—two important components of overall well-being (Diener et al., 1985; Sheldon, 2016)—proximally (i.e., immediately after mortality salience). The reason why researchers have given little attention to these measures is because they have actually administered affect scales after mortality salience as the filler task before the primary (distal) outcome measure. Researchers have chosen to do this in order to help determine whether or not affect plays any role in the effect of mortality salience on the primary (distal) outcome. Thus, the affect measures were never of primary interest. On the whole, this research has shown that mortality salience does not have a proximal effect on affect.

In our research reviewed earlier, we examined anxiety and well-being distally because prior research had not reliably found proximal effects of mortality salience on affect. Nonetheless, we did conduct four studies in which we measured affect or anxiety proximally. In two of these studies (Routledge et al., 2010), we measured self-worth (Rosenberg, 1965), experimentally manipulated mortality salience (vs control), and then immediately measured positive and negative affect with the Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). In both studies, mortality salience did not influence positive or negative affect, and there was no interactive effect of self-worth and mortality salience on positive or negative affect.

In two further studies, we again measured self-worth, experimentally manipulated mortality salience (vs control), and then measured anxiety (Routledge et al., 2010) or death anxiety (Abeyta, Juhl, & Routledge, 2014). However, in these studies, we additionally manipulated whether there was a filler task (word search puzzle) in between the mortality salience induction and the measure of anxiety. The results converged across both studies. When anxiety was measured distally (i.e., when participants completed a word search puzzle after the induction), we found that mortality salience increased anxiety for individuals with low, but not high, self-worth. When anxiety was measured proximally, this effect did not occur. In short, mortality salience increased anxiety for individuals with low self-worth, but only when anxiety was measured distally.

At this point, it appears that there is no evidence that, at the proximal level, mortality salience has any negative psychological consequences. However, further work by Lambert et al. (2014) has demonstrated that there are limitations to the research that has examined affect proximally. Lambert et al. (2014) have shown that once these limitations are overcome, there is evidence that conscious death thoughts also have adverse psychological effects.

Limitations of proximal tests. Lambert et al. (2014) began by surveying the extant research. From this, they proposed that previous research largely failed to unearth proximal effects of mortality salience on affect because researchers have (1) compared mortality salience to nonneutral control conditions and (2) used insensitive or inappropriate measures of affect.

First, researchers have typically compared the mortality salience condition to another condition that induces negative thoughts (e.g., exam failure, physical pain) instead of a neutral condition. They have done this to ascertain whether the effects of mortality salience are due to death thoughts or due to negative thoughts more generally. However, as Lambert et al. (2014) noted, this means that if mortality salience does indeed lead to negative affect, it would not be detected in studies that have compared mortality salience to other conditions that also lead to negative affect.

Second, Lambert et al. (2014) noted that the scales used to measure negative affect are not sensitive enough to detect the specific affective states that death thoughts should arouse. Specifically, the PANAS is the most common scale researchers have used. However, the PANAS measures negative affect by combining responses to 10 different adjectives (i.e., afraid, scared, nervous, jittery, irritable, hostile, guilty, ashamed, upset, distressed), some of which are irrelevant to thoughts of death (e.g., guilt, ashamed). Thus, if mortality salience does make individuals fearful or anxious, it is not likely to be detected by a scale that also measures irrelevant affective states.

Overcoming the limitations. In Lambert et al. (2014) survey of the literature, they set out to identify whether any existing studies rose above these two limitations. While they did identify 39 mortality salience studies that used a neutral control condition, they did not find the affect measures used in these studies to be adequate. However, they did draw attention to the fact that some of these studies measured affect with the PANAS-X (Watson & Clark, 1994). The PANAS-X contains a subscale called "fear" that measures fear and anxiety with six adjectives (afraid, frightened, scared, nervous, jittery, shaky). Although Lambert and colleagues pointed to issues with this subscale (e.g., heterogeneity), they also noted that two out of the three existing studies that actually reported the effects of mortality salience on this subscale demonstrated that mortality salience increased scores on this subscale (Harmon-Jones et al., 1997; Experiments 1 and 3). This suggests that mortality salience proximally increased anxiety and fear. This careful analysis of the existing literature suggests that when the main limitations are largely overcome, there is support for the notion that conscious death thoughts have negative psychological consequences.

While Lambert et al.'s (2014) survey of the literature found some evidence supporting the claim that the awareness of death has aversive psychological consequences, these researchers subsequently embarked on a set of new studies to completely circumvent the limitations of prior work. Specifically, in three studies, they randomly assigned participants to a

standard mortality salience condition (i.e., writing about thoughts and feelings concerning death) or a neutral control condition (i.e., writing about mundane daily activities). Immediately following this task, they measured affect with adjectives targeting the specific affective states that are most relevant to the threat of death. In particular, they measured fear (with the adjectives fearful, afraid, scared, and frightened) and anxiety (with the adjectives anxious, nervous, and worried). They found that mortality salience (relative to the neutral control condition) heightened fear and anxiety, with the effect on fear being much stronger and more reliable. These results clearly illustrated that mortality salience proximally increases negative affect, and they provided further support for the general claim that the awareness of death has negative psychological consequence.

Lambert et al. (2014) further examined the affective consequences of conscious death thoughts using a method in which they did not have to explicitly prime participants with the affective states they were measuring. To do this, they analyzed the content of participants' open-ended responses to the instructions in the mortality salience and control conditions. They found that responses in the mortality salience condition contained more words expressing fear (e.g., afraid, fear, frantic, horror, scary, terrify) and anxiety (e.g., anxious, apprehension, nervous, tense, uneasy, worry) than those in the control condition. The effect on fear-related words was considerably stronger. This further confirms that death thoughts do indeed engender adverse psychological states, most prominently fear.

Are proximal effects attenuated among individuals protected by self-worth? It is also important to consider whether the proximal effect of mortality salience on fear and anxiety that Lambert et al. (2014) found is reduced among those who are protected with a strong sense of self-worth. As reviewed earlier, we have found that at the distal level, mortality salience increases anxiety, but only for those with low self-worth. We did not find this at the proximal level (Abeyta et al., 2014; Routledge et al., 2010). However, our capacity to detect such effect at the proximal level could perhaps have been due to the limitations pointed out by Lambert et al. (2014; e.g., our use of nonneutral control conditions). Unfortunately, no studies have examined how the proximal effects of mortality salience (vs a neutral control condition) on Lambert et al.'s (2014) measures of fear and anxiety vary as a function of self-worth. However, there is one key study that did examine how self-worth influences the effect of conscious death thoughts on anxiety (Greenberg et al., 1992; Study 1).

Greenberg et al. (1992; Study 1) investigated whether experimentally augmenting self-worth prevents anxiety engendered by viewing a graphic video about death. They first experimentally manipulated self-worth by providing participants with feedback on their personality, ostensibly based on questionnaires that participants had previously completed. Specifically, they randomly assigned participants to receive neutral personality

feedback (i.e., "While you have some personality weaknesses, you are generally able to compensate for them," and "Some of your aspirations may be a bit unrealistic") or positive personality feedback (i.e., "While you may feel that you have some personality weaknesses, your personality is fundamentally strong," and "Most of your aspirations tend to be pretty realistic"). They next randomly assigned participants to watch graphic death-related video footage (e.g., autopsy, execution) or neutral footage. Immediately after this, they measured anxiety (Spielberger et al., 1970). Results demonstrated that for those who received neutral feedback, viewing graphic footage of death increased anxiety. However, this effect was not present for those who received positive feedback. In short, viewing graphic footage of death increased anxiety, but boosting self-worth eliminated this effect.

Greenberg et al.'s (1992) study is important for at least two reasons. First, it corroborates the general conclusion that the awareness of death leads to anxiety. Second, because self-worth was experimentally manipulated, it demonstrated the causal role that self-worth plays in preventing the awareness of death from engendering anxiety. This helps overcome a limitation of our own work in which we measured self-worth. While Greenberg et al. (1992) supports TMT's claims about well-being, it is noteworthy that their study is not directly comparable to our work or Lambert et al.'s (2014). In particular, the use of graphic videos is a much more potent induction of death thoughts than the standard mortality salience induction (writing about death). Additionally, Greenberg et al. (1992) used a different anxiety measure than the measures used by Lambert et al. (2014). For the sake of completeness, future studies should examine the effects of typical mortality salience inductions on Lambert et al.'s (2014) measures of fear and anxiety as a function of both experimentally manipulated and trait levels of self-worth at both the proximal and distal level.

Summary

Research initially found no evidence that consciously pondering death thoughts has a negative impact on psychological well-being. That is, research had revealed no proximal effect of mortality salience on positive or negative affect. However, Lambert et al. (2014) found that this lack of an effect was due to the use of nonneutral control conditions and inappropriate measures of affect. They further revealed that when these limitations are overcome, mortality salience does indeed instigate fear and anxiety at the proximal level. Thus, consciously contemplating death does have a negative effect on well-being. This supports TMT's claims that it is important for psychological well-being that humans have structures in place to keep themselves from constantly being preoccupied with their death.

THE RELATIONSHIP BETWEEN AFFECT AND TERROR MANAGEMENT STRATEGIES AFTER MORTALITY SALIENCE

As I previously mentioned, researchers have chosen to measure affect as the filler task after mortality salience inductions when examining distal strategies, such as investing in cultural worldviews. They have largely done this to help determine whether participants' current affective state accounts for distal strategies deployed in response to mortality salience. It is reasonable, for example, that people become defensive of their belief systems after mortality salience simply because thinking about death puts them in a sour mood. But, as I already noted, researchers had ruled this out, in part, because research found no evidence that mortality salience elevates negative affect. However, the present review clearly reveals that mortality salience does bear affective consequences—it increases fear and anxiety at the proximal level, and at the distal level, it produces similar effects for those not protected with a sense of meaning or self-worth. This again raises the question as to whether or not the effects of mortality salience are due to the negative affect it causes.

Lambert et al. (2014) attempted to address this question empirically by measuring worldview defense in one of their studies. Based on previous research demonstrating that mortality salience increases investment in nationalistic worldviews (e.g., Greenberg et al., 1990), they examined American participants' level of patriotism with items such as, "I am proud to be an American." They measured patriotism after inducing mortality salience (vs neutral control) and administering their measures of fear and anxiety. Results revealed that mortality salience instigated fear and heightened patriotism. However, these effects were completely independent. There was no evidence that the effect of mortality salience on increased patriotism was due to the increased fear that mortality salience also caused. Lambert et al. (2014) thus helped rule out the possibility that negative affect accounts for the effect of mortality salience on worldview defense.

Is it noteworthy that Lambert et al. (2014), as well as most prior work, tested whether negative affect that is measured proximally explains worldview defense that is measured distally. It is possible that fear did not play a role in the effect of mortality salience on worldview defense because fear was measured proximally while worldview defense (a distal strategy) was measured distally. Given that proximal and distal strategies represent distinct ways to respectively manage conscious and unconscious death thoughts, it is sensible to consider the possibility that (1) proximally measured negative affect underlies proximal strategies while (2) distally measured negative affect underlies distal strategies. I will consider the plausibility of each of these in turn.

Is proximally measured negative affect responsible for causing proximal strategies? I do not have a firm position regarding the answer to this question. However, it is reasonable to suspect that at least some proximal

strategies represent efforts to downregulate the feelings of fear and anxiety engender by consciously contemplating death. Proximal strategies (e.g., health behavior, death thought suppression) are direct, problem-focused, and fairly logical ways to manage the problem of death. Because they are such direct ways to manage the source of fear, individuals may employ them to reduce the fear.

I, conversely, do not suspect that distally measured negative affect is responsible for causing distal strategies. This is because, at the distal level, the individuals who are most likely to engage in worldview defense after mortality salience are not the same individuals who experience anxiety after mortality salience. In particular, individuals with high self-worth are the ones who display increased worldview defense in response to mortality salience (Juhl & Routledge, 2014b; see also Burke, Martens, & Faucher, 2010). However, as reviewed earlier, it is individuals with low self-worth who experience increased anxiety from mortality salience (Abeyta et al., 2014; Routledge et al., 2010). Similarly, individuals with greater levels of interdependent self-construal are the ones who engage in worldview defense after mortality salience (Routledge, Juhl, Vess, Cathey, & Liao, 2013). Yet, as I have reviewed, it is individuals with low levels of interdependent self-construal who experience increased anxiety from mortality salience (Juhl & Routledge, 2014a). Finally, individuals with a high personal need for structure are the ones who cling most vehemently to their worldviews after mortality salience (Juhl & Routledge, 2010). But it is individuals with a low personal need for structure who experience increased anxiety as a result of mortality salience (Routledge et al., 2013). Because the individuals who are most likely to engage in worldview defense are not the same individuals who experience anxiety, it seems unlikely that anxiety caused by mortality salience at the distal level leads to worldview defense. The overall pattern of results actually reveals that the individuals who are most likely to defend their worldviews (individuals with high self-worth, high interdependent self-construal, or high personal need for structure) are the same individuals who do not experience increased anxiety after mortality salience. This suggests that worldview defense observed among these individuals may account for the lack of anxiety they experience after mortality salience. For these individuals, clinging to existing sources of security may prevent anxiety that is otherwise experienced after mortality salience.

In summary, it is plausible that the proximal effect of mortality salience on negative affect accounts for some proximal strategies. On the other hand, it is less plausible that the distal effect of mortality salience on negative affect accounts for distal strategies. The available data conversely suggests that engaging in distal strategies, such as investing in cultural worldviews, may help circumvent negative affect caused by death thoughts. Nevertheless, to my awareness, the nature of the relationship between proximally measured negative affect and proximal strategies, and the nature of the relationship

between distally measured negative affect and distal strategies remain open empirical questions. It would be useful for future research to address these questions; however, I should caution that empirically tackling these questions presents some methodological hurdles. This difficulty lies in timing the measurement of proximal and distal strategies after the mortality salience induction. The measurement of affect at either the proximal or distal level is likely to interfere with the measurement of the proximal or distal strategy. For example, proximal strategies need to be assessed immediately after the mortality salience induction, when death thoughts are still in conscious attention. However, testing whether a proximal strategy is due to negative affect would require measuring affect before measuring the proximal strategy. This would be problematic because measuring affect would allow death thoughts the opportunity to decay from the center of conscious attention by the time the proximal strategy is measured.

CONCLUDING REMARKS

TMT proposes that humans need to possess perceptions of meaning and self-worth in order to evade fear and anxiety that is otherwise engendered by the awareness of death. Supporting the theory, hundreds of studies have demonstrated that the awareness of death accounts, in part, for people's efforts to find meaning and attain a sense that their lives have significance that transcends their corporeal selves. However, only recently has research more fully verified the theory's central claims about psychological well-being. The present inspection of this research has evidenced that the awareness of death does lead to anxiety and undermine well-being, and that terror management strategies are needed to circumvent this anxiety and maintain well-being.

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Chapter 14

The Terror Management of Meaning and Growth: How Mortality Salience Affects Growth-Oriented Processes and the Meaningfulness of Life

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> *. . . for the man who is not afraid to die is not really alive.*
>
> William Barrett, *Irrational Man: A Study in Existential Philosophy* (1958, p. 94)

In contemplative moments with family or friends, the reader may have heard the phrase "death is a part of life." It seems that this expression is at times meant to inspire acceptance of death's inevitability. However, in other instances, it may also be utilized to shake one into deeply considering the trajectory of one's life and to assess whether it is providing fulfillment, purpose, and a sense of lasting significance. Death is indeed a part of life; but, life is also a part of life. And, even against the backdrop of death's inevitability, people appear readily able to get on with experiencing a life characterized by feelings of purpose, significance, growth, and authenticity. In this chapter, we explore some of the ways that terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) has been used to understand the psychological processes that shape how concerns about personal mortality influence growth-oriented outcomes and the perceived meaningfulness of one's life. As such, the chapter offers insights into what has traditionally been viewed as an antagonistic relationship between death awareness, on the one hand, and psychological flourishing on the other. Does death awareness always threaten the meaningfulness of one's life? Are closed-mindedness and dogmatic commitments to preexisting knowledge and beliefs the only

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effective means for dealing with concerns about death? Answers to such questions are no doubt complex, but TMT-inspired research has begun to carve out empirically-tested approaches to resolving them.

A BRIEF PRIMER ON TERROR MANAGEMENT THEORY

Influenced by the work of cultural anthropologist Ernest Becker (1962, 1973, 1975), TMT posits that human awareness of inevitable personal mortality grates against an evolved predisposal toward sustaining life, giving rise to the potential for intense existential anxiety. Despite this apposition, people live with relative equanimity via a dual-component psychological defense system constituted by cultural worldviews and self-esteem. Cultural worldviews are internalized and consensually validated beliefs about the nature of reality that imbue existence with structure, order, meaning, and standards of value by which to live. Self-esteem is feeling personally significant by successfully living in accord with the values of one's cultural worldview. Sustained confidence in the validity of one's cultural worldview combined with the cultivation of self-esteem via thinking and behaving in culturally valued ways grants one access to death transcendence via literal (e.g., religious notions of an afterlife; see Chapter 12, this volume) or symbolic (e.g., secular cultural achievements; see Chapter 13, this volume) immortality. Thus, in order to manage the threat associated with the reality of personal mortality, people embed themselves in a symbolic world of meaning that provides pathways to significance and a perceived sense of immortality.

Because cultural worldviews and self-esteem provide insulation against death-related concerns, the subtle activation of death thoughts (mortality salience, MS) intensifies reliance on these psychological defenses (see Chapter 1, this volume; Burke, Martens, & Faucher, 2010; Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). Participants exposed to death-related stimuli, including open-ended questions about one's own death, interviews proximate to a funeral parlor, and subliminal exposure to the words "death" or "dead," more fervently bolster those who uphold the cultural worldview and disparage those who threaten it. For example, Christian participants encouraged to write about their mortality (vs a control topic) reported more positive evaluations of a Christian target and more negative evaluations of a Jewish target (Greenberg et al., 1990). In addition to cultural worldview defense, MS also escalates self-esteem striving, or an increased effort to live up to the standards of value by which one derives feelings of significance and self-worth. For instance, following a standard MS induction (see Chapter 4, this volume), participants whose self-esteem was contingent upon physical strength displayed greater physical strength measured by a hand dynamometer (Peters, Greenberg, Williams, & Schneider, 2005), and participants who derived self-esteem from their driving skill engaged in more risky maneuvers in a driving simulator (Taubman Ben-Ari, Florian, & Mikulincer, 1999). Relatedly, receiving

information that enhances the validity of one's cultural worldview or bolsters one's self-esteem reduces the need for defensiveness in response to death concerns. For example, following MS, momentarily elevated implicit self-esteem eliminated cultural worldview defense (Schmeichel et al., 2009) and ostensible evidence of an afterlife eliminated self-esteem striving (Dechesne et al., 2003). Conversely, exposing weaknesses in these psychological defenses brings thoughts about mortality more readily to the fore (see Chapter 1, this volume; Hayes, Schimel, Arndt, & Faucher, 2010). Example studies in this vein have indicated that derogations of Canadian culture increased the accessibility of death-related thoughts among highly nationalistic Canadians (Schimel, Hayes, Williams, & Jahrig, 2007) and exposure to inconsistencies in the Bible increased death-thought accessibility among those high in religious fundamentalism (Friedman & Rholes, 2007). Thus, there is considerable support for the TMT position that people invest in cultural systems of meaning and value in order to quell existential fears.

MORTALITY SALIENCE AND THE PERCEIVED MEANINGFULNESS OF LIFE

Although TMT traditionally emphasized the importance of meaningful views of reality provided by investment in cultural worldviews, direct empirical scrutiny of the ways that MS affects meaning in life has only recently emerged (Arndt, Landau, Vail, & Vess, 2013; Vess, 2013). This emergence has, perhaps not surprisingly, coincided with a relative explosion of research specifically focused on the meaning in life construct (Hicks & Routledge, 2013). This work has converged on a widely accepted definition of meaning in life as the extent to which people judge or perceive their lives to be coherent, purposeful, and significant (Heintzelman & King, 2014; Hicks & King, 2009; Martela & Steger, 2016; Park & George, 2013). These subjective perceptions are accurately and reliably assessed via various self-report measures (e.g., Steger, Frazier, Oishi, & Kaler, 2006) and have been identified as a centrally important aspect of health and functioning. For example, perceiving life as more meaningful positively predicts greater psychological well-being (Zika & Chamberlain, 1987), greater self-reported physical health (Steger, Mann, Michels, & Cooper, 2009), lower anxiety and depression (Zika & Chamberlain, 1992), weaker symptoms of posttraumatic stress among veterans (Owens, Steger, Whitesell, & Herrera, 2009), and greater longevity (Hill & Turiano, 2014). Meaning in life is therefore critically linked to greater psychological and physical health, but does it combat the consequences of mortality awareness?

From the perspective of TMT, perceptions of meaning in life are provided by secure and stable cultural worldviews and routes to self-esteem (Vess, 2013). The meaning that people derive from these critical components of the death-anxiety buffer consequently functions to protect people from the negative psychological consequences of knowing that death is inevitable.

TMT thus argues that people are in large part motivated to construct and maintain meaning in life as a way to combat the negative consequences of mortality awareness. Indirect support for such a view has been provided by substantial research showing that reminders of personal mortality increase investment in structures such as close relationships (Chapter 10, this volume) and religious beliefs (Chapter 12, this volume), which both contribute to the meaningfulness of life. Research by Routledge and Juhl (2010) provides more direct support by showing that individual differences in meaning in life moderate the effect of mortality reminders on death anxiety. Specifically, participants who were reminded of mortality subsequently reported greater death anxiety, but only if they reported relatively low levels of meaning in life on a meaning in life questionnaire administered earlier in the study. People relatively high in meaning in life were unaffected by the death reminder. This highlights the critical terror management function that perceptions of meaning in life serve: maintenance of psychological equanimity in the face of mortality awareness.

Of course, while meaning in life may serve a palliative function in the face of death awareness, the potential for death awareness to affect the meaningfulness of life also seems likely. Some might persuasively argue that the inevitability and unpredictability of death can render one's daily activities devoid of meaning. It would, after all, seem quite difficult to maintain a view that one's life is significant if it can be snuffed out at any moment for seemingly arbitrary and chaotic reasons. However, as described earlier (and elsewhere in this volume), people do not face the psychological challenges of mortality awareness unarmed, and an emerging body of research has revealed that certain psychological variables moderate the effect of MS on perceptions of meaning in life. The broad theoretical point of this work is that MS should decrease meaning in life only when psychological resources that imbue life with meaning are not secure or readily engaged.

Focusing on one of the most central sources of existential protection identified by TMT, Routledge et al. (2010) explored how subtle reminders of mortality affect judgements of meaning in life for people high and low in self-esteem. TMT conceptualizes self-esteem (see Chapter 7, this volume) as the positive feelings about one's self that derive from perceptions that one is successfully adhering to the values of one's cultural worldview. People invested in a worldview that values academic achievement, for example, would receive boosts to self-esteem from feedback that they are successful academics (see also, Crocker & Wolfe, 2001). Such feelings of self-esteem are also likely linked to the feelings of significance that are critical to conceptions of meaning in life, a likelihood supported by documented positive associations between self-esteem and meaning (Steger et al., 2006). The TMT analysis of meaning thus predicts that people who possess high levels of self-esteem should be protected from the negative effects of mortality awareness on judgments of meaning in life. Routledge et al. (2010) tested this prediction using the standard

methods (see Chapter 4, this volume) of TMT research. Participants who varied in self-esteem were exposed to an MS or aversive control topic condition and subsequently rated the perceived meaningfulness of their lives. Results indicated that MS decreased perceptions of meaning in life for people low in self-esteem, but had no effect on meaning in life for people high in self-esteem. A subsequent convergent study also revealed that MS increased the search for meaning in life, but only among low self-esteem participants (Juhl & Routledge, 2013). Together, these studies support the TMT prediction that possessing secure meaning-providing resources (i.e., self-esteem) protects meaning in life in the face of mortality concerns.

The ability to think temporally undergirds another source of meaning in the face of death awareness. The capacity for temporal thought not only allows humans to contemplate what awaits in the future, including their own demise, but also affords the capacity to reflect on the past. With this reflection can come feelings of nostalgia, an emotional sense of longing and affection toward the past that is aroused when one contemplates momentous past life events. Research indicates that nostalgia serves a host of psychological functions related to well-being (Chapter 8, this volume; Wildschut, Sedikides, Arndt, & Routledge, 2006), including its positive influence on self-esteem, social connectedness, and perceptions of meaning in life. From a TMT perspective, such psychological benefits should provide those who engage in nostalgia with a secure source of meaning and perceived significance. Nostalgia should therefore serve a meaning-protective function when thoughts of death are active (Chapter 8, this volume), and MS should decrease meaning in life only for those not frequently engaged in nostalgic reverie. Research has supported this prediction. Routledge, Arndt, Sedikides, and Wildschut (2008) exposed participants who varied in nostalgia proneness to an MS or control prime and subsequently assessed feelings of meaning in life. Consistent with the idea that mortality concerns should only decrease meaning when existing sources of meaning are insecure, participants who reported low levels of nostalgia engagement experienced lower meaning in life following MS (vs control). Participants who frequently waxed nostalgia, in contrast, did not differ in meaning in life as a result of MS.

The pursuit of important life goals is also relevant to this discussion, though in ways that may, at first blush, seem counterintuitive. Personal goals organize thoughts and actions, providing one with a sense of consistency and coherence, which contribute to meaning by instilling a sense of order and purpose in one's life. Indeed, there is a well-documented connection between making progress toward one's goal and judging one's life as meaningful (King, Hicks, Krull, Gaiso, & Carver, 2006). From the perspective of TMT, the possession of important life goals should serve a critical meaning function that thwarts the potential for existential distress. Vess, Rogers, Routledge, and Hicks (2017) drew from this sort of logic to theorize that people may become vulnerable to deficits in meaning as they approach the completion of a

long-term goal. Specifically, they argued that perceiving a goal to be closer to completion can undermine the security of the meaning that the goal provides. As an example, consider the professional who has spent a career working to "move up the ladder." When she reaches the top, the goal that has structured much of her long career (i.e., to "reach the top") no longer exists, potentially leaving a vacuum of coherence and meaning-providing structure in her daily life. Vess et al. (2017) thus hypothesized that perceptions of high (vs low) progress on important life goals would moderate the effect of MS on perceptions of meaning in life. They predicted that MS would decrease meaning in life when people perceived that they were nearing the completion of an important goal (high progress), but not when people perceived that they were relatively farther away from goal completion (low progress).

To test these predictions, Vess et al. asked university undergraduates to identify a long-term academic goal that they were currently pursuing and then randomly assigned them to reflect on personal mortality, feelings of being uncertain, or the experience of listening to music (neutral control). All participants then completed a standard delay task (see Chapter 2, this volume), followed by random assignment to conditions of a goal-progress manipulation used in the previous research (Fitzsimons & Fishbach, 2010). All participants were shown the goal that they previously identified in the study, and participants in the high-progress condition reflected on all the work they had done and the progress they had made on it. In contrast, participants in the low-progress condition reflected on all the progress that remained to be made on the goal. All participants then completed a standard measure of meaning in life (Steger et al., 2006). Vess et al. found that, as predicted, MS decreased meaning in life only when people felt closer to completing an important long-term goal. This suggests that perceptions of goal progress can cause disruptions to the security of one's sense of meaning when existential concerns about mortality are activated. However, in a subsequent study, this effect was critically only observed among individuals who reported difficulty transitioning to and adopting new goals (i.e., people low in locomotion; Higgins, Kruglanski, & Pierro, 2003). People who easily transition to new goals upon focal goal completion were generally unaffected by perceptions of goal progress when mortality concerns were elevated. Thus, when taken together, these findings support the more general theoretical point that MS decreases the perceived meaningfulness of life when existing sources of meaning are insecure, disrupted, or not fully engaged.

Finally, research on MS and meaning in life has revealed how individual differences in the engagement of simple structure can alter the meaning consequences of death-relevant thought. As described elsewhere (see Chapter 5, this volume), cognitively structuring the world in simple and coherent ways lays a foundation for secure terror management structures (e.g., worldviews) that help people psychologically manage the potential negative consequences of death awareness. Some people, however, appear to more strongly and readily engage the basic cognitive structures that

facilitate coherent and stable knowledge about the world. Landau et al. (2004), for example, have shown that MS leads people high in dispositional tendencies to seek out simple understandings of the world (i.e., personal need for structure; PNS; Neuberg & Newsom, 1993) to increasingly cling to coherence-providing mental structures like heuristics and just-world beliefs. One implication of such findings is that people who do not immediately seek out simple forms of knowledge in response to MS may be vulnerable to deficits in meaning and death anxiety. Indeed, Routledge, Juhl, and Vess (2013) found that people low (but not high) in PNS experienced heightened death anxiety following a standard MS induction. Similarly, and more relevant to the focus of this chapter, Vess, Routledge, Landau, and Arndt (2009) found that individual differences in need for structure moderate the effects of MS on judgments of life's meaningfulness. From a TMT perspective, people high in need for structure, or those who privilege clear-cut interpretations and beliefs about the world, should be more able to effectively maintain a perceived sense of meaning in life when death concerns are elevated because such orientations to the world are resistant to flux and, in turn, provide a reliable source of stable and coherent meaning. Vess et al. found support for this view; high need for structure people maintained a sense of meaning in life following exposure to MS inductions. In contrast, people low in PNS experienced lower levels of meaning in life following MS, relative to control conditions.

In sum, TMT proposes that perceptions of meaning in life, defined as the extent to which people judge their existence as coherent, purposeful, and significant, serve a protective function against the often negative implications of death awareness. People need to believe that their lives have some significance and purpose beyond the trivial. Supporting this, research shows that reminders of mortality increase explicit reports of death anxiety among people who experience their lives as relatively low in coherence, significance, and purpose. TMT also suggests, however, that certain psychological structures and processes facilitate the maintenance and construction of meaning in life in the face of death's inevitability. Empirical work has so far implicated self-esteem, nostalgic reverie, goal pursuit, and individual tendencies to engage basic cognitive coherence-providing structures (e.g., heuristics) as important for such endeavors. When these structures are insecure or not fully engaged, death reminders trigger a subjectively experienced decline in the meaningfulness of life. Thus, broadly speaking, the shadow of personal mortality need not strike a deafening blow to meaning, so long as people's flexible meaning-providing resources remain secure and ready to be deployed.

BEYOND EXISTING SOURCES OF MEANING: MORTALITY SALIENCE, OPENNESS, AND CREATIVITY

At the same time, while TMT research has made clear that people can effectively maintain perceptions that life is meaningful, purposeful, and

significant through the stability and security of existentially relevant psychological structures (e.g., self-esteem), an important aspect of the previously reviewed research is that it rarely demonstrates a *bolstering* effect on meaning in response to MS. That is, the above findings reveal how people maintain meaning in life when death thoughts are activated but do not reveal how death thoughts might actually catalyze growth and flourishing. This latter issue is, to be sure, of a very different kind than asking how people maintain a sense of meaning and purpose. It is, however, nevertheless an important one to consider within the framework of terror management. After all, it would seem critical for a theory with as diverse a set of implications as TMT to offer some insight into the more positive aspects of human social life. How does the awareness of death influence psychological processes characterized by an openness to and engagement of enriching experiences that run counter to the dogmatic and rigid processes that undergird the defensive bolstering of one's preexisting beliefs? Although less robust than the swaths of research on the negative consequences of death awareness (e.g., prejudice), a growing body of work that organizes around this "positive" form of terror management (Vail III et al., 2012) generally, and creativity more specifically (Perach & Wisman, 2016), helps address such questions.

The prototypical TMT finding, or at least the finding that is most frequently described when discussing the theory, is the finding that subtle reminders of mortality increase people's defensive clinging to their preexisting beliefs and sources of meaning. MS was indeed identified as a motivational factor in the adoption of ideologies characterized by dogmatism and an intolerance of ambiguity (Jost, Glaser, Kruglanski, & Sulloway, 2003). Yet, despite such evidence, a second wave of TMT research has yielded evidence that mortality concerns can, in some circumstances, compel people to act in ways that reflect an enhanced openness to new and ambiguous perspectives. For instance, Vess et al. (2009) showed that, while low-PNS people experience declines in meaning in life after MS inductions, they also demonstrate a relatively higher openness to novel and culturally unfamiliar information. In one study, low-PNS participants who reflected upon mortality indicated greater interest in documentary films focused on worldview threatening perspectives. Another study (Routledge, Juhl, & Vess, 2010) found that MS led low-PNS participants in the United States to show greater positivity toward nontraditional celebrations of American Thanksgiving. These studies provide important evidence that, rather than always fostering a closed-minded dogmatism and eager "clinging" to culturally familiar ideas, MS can in some circumstances instill a motivational state characterized by a desire to explore enriching unfamiliar ideas and experiences.

Keeping with that theme, another pocket of TMT research focuses squarely on creativity, a virtuous character strength emphasized in prominent models of positive psychological flourishing (e.g., Peterson & Seligman, 2004). Creativity is highly valued within most cultural worldviews and is widely associated with positive aspects of a fulfilled life such as intrinsically

motivated action (Deci & Ryan, 1987), self-actualization (Maslow, 1954; Rogers, 1961), and personal insight and growth (Hennessey and Amabile, 2010). Creativity, by definition, involves divergence from established ways of thinking or acting: a metaphorical leap from the familiar to the unfamiliar (Amabile, 1983). This implies that stimulating one's creative capacities may bolster cognitive flexibility and openness toward diverse perspectives and may even promote active seeking-out or exploration of novel information. Because much TMT-inspired research has shown that subtle death reminders promote not only rigidity and closed-mindedness toward cultural worldviews that diverge from one's own, but also derogation, prejudice, and aggression toward those who hold such views, researchers questioned whether creative engagement might mollify such strict negativity by promoting a more open mindset in response to MS. Routledge, Arndt, and Sheldon (2004) primed mortality (or dental pain), asked American participants either to engage in a creative t-shirt designing task or a noncreative task of sketching an outline of the room, and measured cultural worldview defense via reactions to the authors of pro- and anti-American essays. Consistent with hypotheses, creative engagement reduced worldview defense following MS. Routledge and Arndt (2009) similarly found that creative expression following MS can increase interest in social (e.g., meeting strangers), intellectual (e.g., exploring unusual ideas or theories), and environmental (e.g., exploring new places) exploration. Finally, Boyd, Morris, and Goldenberg (2017) similarly found that people high in openness to experience, a trait linked to creativity, do not display defensiveness in the face of mortality concerns. These findings together indicate that mindsets characterized by creativity and openness can direct terror management processes along psychologically enriching trajectories.

Of course, while creativity is associated with a host of psychological and social benefits, psychodynamic theorists have long speculated that it might also come with a dark side. On the one hand, creative engagement facilitates both feelings of uniqueness and significance in the creative individual and spurs important cultural (artistic, technological) advances that enhance the lives of others. On the other hand, creativity typically implicates a deviation from established modes of thought or action which may cause the creative individual to feel severed from meaningful belief systems and comforting social relationships. Existential theorists, particularly Becker (1973) and Rank (1932/1989), discussed this dual nature of creativity. In the parlance of TMT, creativity's potential to effectively quell concerns about mortality is at once enhanced because creative activity boosts one's perceptions of being a significant contributor to a meaningful universe (i.e., one's self-esteem) and diminished because it spells a schism from one's meaning-supplying cultural worldviews and social relationships. Rank proposed that creativity, as it is characterized by originality and uniqueness, threatens people's motivation to remain optimally distinct (Leondardelli, Pickett, & Brewer, 2010)—to be

just enough of an individual that one is recognized as such, while remaining securely connected to one's worldviews and relationships. Rank argued further that in some cases, creative engagement produces feelings of guilt due to the rupture from one's stable beliefs and relationships. Drawing from this analysis, Arndt, Greenberg, Solomon, Pyszczynski, and Schimel (1999) hypothesized that because the maintenance of stable social connections serves an integral role in buffering potential death anxiety (e.g., Mikulincer, Florian, & Hirschberger, 2003), a death reminder would increase feelings of guilt in creative participants. In two studies, participants exposed to a death prime and asked to write creatively about a dream indicated higher self-reported guilt compared to control participants. Given that increased guilt following mortality awareness and creative engagement was hypothesized to stem from feelings of social disconnection, a third study tested and found support for the hypothesis that MS and creativity motivated social reconciliation via increased levels of social projection (i.e., perceived consensus with others). Moreover, addressing belongingness concerns eliminates the negative consequences of creativity and illuminates some of the psychological benefits of creative engagement under existential threat (Arndt, Routledge, Greenberg, & Sheldon, 2005). Specifically, enhanced feelings of social connectedness followed by a mortality prime and creativity task increased positive mood, creative problem solving, and vitality.

Feelings of social connectedness specifically, and the integrity of one's cultural worldview more generally, also appear to be important for understanding the motivational effects of mortality concerns on creative output. Undoubtedly, creative engagement is motivated by a constellation of influences. Of particular interest for present purposes are both the motive to contribute creatively and significantly to the broader social context (Csikszentmihalyi, 1996) and the motive to attain immortality via creative expression (Lifton, 1983). Building on previous research highlighting the interplay between social connectedness, death concerns, and creativity, Routledge, Arndt, Vess, and Sheldon (2008) primed participants with mortality (or dental pain) and then measured creative expression via a concert promotion task. Critically, Routledge et al. manipulated whether the participants themselves or the community would benefit from their creativity. Results indicated that MS decreased creativity when the task was self-focused but not when community focused. Thus, the negative consequences of individuated acts of creativity may not impede socially oriented creativity following a death reminder. Additional research has explored the effects of MS on creativity operationalized as humor generation (Long & Greenwood, 2013). Participants were either implicitly or explicitly primed with the topics of death or physical pain and then presented with cartoons from newspapers and asked to generate humorous captions. Results indicated that raters found the captions written by participants implicitly primed with death funnier than those written by participants implicitly primed with pain. Finally, research

exploring the death-anxiety buffering function of creativity indicated that for participants with high, but not low, levels of creative goals, greater levels of self-reported creative achievement were associated with reduced death-thought accessibility following a death reminder (Perach & Wisman, 2016).

Mortality concerns may also stimulate creativity engagement if such activity contributes to the establishment of a long-remembered legacy. According to TMT, such a legacy provides an avenue of death transcendence via symbolic immortality: aspect(s) of one's existence (one's work, one's children, stories of one's deeds) live on within the cultural milieu after physical death. Based on this notion, researchers primed mortality (or another aversive topic) and informed participants that they were part of a creative naming contest for newborn zoo animals. The rules of the contest stipulated that the most creative name would be displayed prominently along with the name of the winning participant at the animal's enclosure. The opportunity for a legacy was manipulated by telling participants that the animal could live for up to 100 years (legacy) or up to 1 year (study 1; Sligte, Nijstad, & De Dreu, 2013). Results indicated that MS increased creativity when such expression provided an opportunity for a legacy compared to when no opportunity for a legacy was offered.

In sum, TMT research has shown that the combination of mortality concerns and creative engagement produces a variety of effects. Being creative after contemplating mortality can reduce cultural worldview defense and promote both open-mindedness and exploration of novelty. Yet, the ingenuity and novelty inherent in creativity sets one adrift from one's security-providing beliefs and relationships. This separation can produce guilt when the importance of cherished values and relationships becomes heightened amid thoughts of death. However, if feelings of connectedness are bolstered, contemplating death and creative engagement no longer result in guilt, but give way to increased positive mood, continued creativity, and feelings of vitality. Finally, when one's creative pursuits are directed toward ends that ultimately strengthen terror management defenses (e.g., social bonds, symbolic legacies), MS can trigger responses that transcend existing sources of meaning via creative works.

MORE THAN CREATIVE: TERROR MANAGEMENT AND THE "GOOD" LIFE

Although creativity is indeed an aspect of psychological growth, it is certainly not the only aspect that a terror management perspective can inform. Indeed, while "death closes all," as Tennyson (1842) succinctly put it, people do not necessarily adopt a nihilistic throwing up of hands in the face of mortality awareness. They continue to learn, change, and grow throughout their lives until that ultimate ending. In fact, existentially oriented philosophers (e.g., Camus, 1942/1955; Heidegger, 1927/1962) and therapists (e.g., Frankl, 1959; May, 1953; Yalom, 1980) have maintained that human growth does not occur in spite of death's inevitability; rather, in some instances,

contemplating one's mortality and its implications promotes psychological growth. By considering one's time as limited, and thus valuable, people are spurred to an awakening of sorts which may lead to a reorientation toward intrinsically motivated and authentically engaged pursuits (Carstensen, Isaacowitz, & Charles, 1999). Empirical findings are beginning to support these claims, demonstrating that, under certain conditions, considering one's inevitable mortal condition can inspire personal growth in a number of ways.

In various forms, existential philosophers have espoused the notion that, rather than comprising an essential static nature, human existence is characterized by the responsibility to continually renew or alter one's projects (e.g., Sartre, 1943/1956). Pursuing one's projects passively, with uncritical acceptance of culturally prescribed beliefs and roles, promotes denial of the human existential predicament, while dynamic effort to form one's views of existence and courage to engage one's projects in accordance with them promotes authentic becoming (Kierkegaard, 1843/1986; Nietzsche, 1883–91/1954). Authentic becoming is an active attempt to fulfill one's possibilities via self-growth and insight; in other words, to become who one really is (Kasser & Sheldon, 2004; Seto, Hicks, Vess, & Geraci, 2016). The extent to which one's goal pursuit is congruent with one's personally important possibilities determines whether one feels authentically engaged in or alienated from one's deepest potentialities (Sheldon & Kasser, 1995). Such congruence depends on two factors: autonomous rather than pressured goal pursuit and pursuit of intrinsically oriented goals such as personal growth, affiliation, and community feeling rather than extrinsically oriented goals such as acquiring high status and wealth (Kasser & Sheldon, 2004). Research indicates that when people's goals are congruent, thus promoting authentic becoming, they experience a host of psychological benefits including deriving more daily need satisfaction from goal pursuit (Sheldon & Elliot, 1999) and increased well-being (Sheldon & Kasser, 1995).

Given the benefits of authentic becoming, intrinsic goal pursuit, and the contention of some existential philosophers and therapists that acknowledgment of one's mortality can result in a reassessment of one's projects toward authentic becoming, research derived from TMT has examined the relationship between MS and shifts between intrinsically and extrinsically motivated goals. When thoughts of death have receded from focal attention, yet remain highly accessible (see Chapter 2, this volume), people engage symbolic defenses such as increased effort to live in accord with cultural standards of value in order to augment feelings of personal significance and esteem (e.g., Routledge, Arndt, & Goldenberg, 2004). Pursuit of extrinsically oriented goals like high social status and accumulation of material wealth are among the most revered pathways to self-esteem within Western cultural worldviews. Research has demonstrated that, following a subtle MS induction and a delay task, participants increasingly endorse extrinsically oriented goals by reporting elevated preferences for high-status goods and becoming greedier in public commons games (Heine, Harihara, & Niiya, 2002; Sheldon & Kasser, 2008). While consistent with

previous terror management theorizing and research that self-esteem striving increases following MS, these findings seem to run counter to existential philosophizing that death contemplation can result in a reevaluation of one's projects toward intrinsic pursuits. However, Kosloff and Greenberg (2009) demonstrated that immediately following a death reminder, when thoughts of mortality remained conscious, participants trivialized the importance of aspiration for extrinsically oriented goals of wealth, fame, and image. Conscious confrontation with death appeared to realign people's goal priorities in a way consistent with growth and expansion.

Additional research examined the impact of death concerns on participants' willingness to invest effort in either personal growth-oriented or culturally derived goals. Participants, some of whom were told to imagine that they had only 1 year to live, wrote about their ideal life, received cards with descriptions of either growth-oriented or culturally derived goals, and were asked to allocate a proportion of 100 poker chips to each card. The number of chips allocated to each card represented the amount of investment they wished to make to each goal. Compared to participants who thought only about their ideal life, participants who thought about death via imagining they had 1 year to live distributed proportionally less chips to the culturally derived goals and more to the personal growth-oriented goals (Martin, Campbell, & Henry, 2004). Again, conscious confrontation with the fragility of one's life prompted a realigning of one's goal priorities.

Research also has explored the relationship between conscious thoughts of death and subsequent goal reevaluation in survivors of a natural disaster (Lykins, Segerstrom, Averill, Evans, & Kemeny, 2007). Conscious thoughts of death during the disaster predicted greater perceived goal shift 8 weeks later. Specifically, death-conscious participants later increasingly valued intrinsic goals, and to a marginal extent, decreasingly valued extrinsic strivings. Thus, although defensive denials of one's vulnerability to death often are marshaled immediately upon thinking about mortality (e.g., Greenberg, Arndt, Simon, Pyszczynski, & Solomon, 2000), these findings also point to potential downstream consequences of conscious death contemplation: greater perceived importance of intrinsic growth-oriented projects and trivialization of less authentic extrinsically motivated pursuits.

A related perspective developed by Cozzolino, Staples, Meyers, and Samboceti (2004) makes a similar point. This work draws from research on near-death experiences and focuses on qualitative aspects of death reflection that can affect growth-oriented outcomes similar to those experienced by people who have nearly died. For example, Cozzolino et al. (2004) explored the impact of a vivid death reflection on goal strivings by prompting some participants to vividly imagine their own death in a burning building. Participants were asked to report detailed thoughts and emotions about the imagined scenario, how they thought they would handle their final moments, thoughts about their life up to that point, and how their family would react to

the event. This was compared to the more traditional and abstract MS induction featured in most TMT research. After the manipulation, participants were informed of a raffle with a $100 gift certificate prize and given the opportunity to take as many tickets as they wished from a limited supply. Critically, taking more tickets increased the individual participant's chance of winning while reducing the winning chances of future participants. Thus, the extrinsic goal of material wealth accumulation could be pursued by greedily taking more tickets for oneself. Results from this and two similar studies indicated that vivid death reflection reduced the number of tickets taken for oneself among participants who previously indicated higher extrinsic goal orientation. Similar findings in this vein have shown that death reflection promotes identity integration, the process by which multiple, potentially conflicting, identities are unified into a coherent self-concept (Blackie, Cozzolino, & Sedikides, 2016). Results from a representative study indicated that participants who thought about death in a specific, individuated manner perceived both positive and negative life experiences as making equal contributions to their current identity, whereas participants in the standard MS and control conditions emphasized the impact of positive (compared to negative) life events in shaping their identity. The finding that death reflection enhances identity integration is important because identity integration is associated with greater well-being. Related findings indicate that death reflection increases prosocial intentions (intentions to donate blood) and enhances feelings of gratitude for life (Blackie & Cozzolino, 2011; Frias, Watkins, Webber, & Froh, 2011).

Finally, recent research has directly assessed how mortality awareness impacts self-reported feelings of authenticity, or the extent to which people feel like they are living in accord with their personal standards and values. Seto et al. (2016) synthesized research showing that vivid memories are accompanied by greater affective significance and motivation (Pillemer, 2001, 2003), with other research indicating that participants possessing greater personal experience with death report less death anxiety and regard their death-associated memories as the symbolic beginning of living and thinking differently (Bluck, Dirk, Mackay, & Hux, 2008). Seto et al. hypothesized that the subjective experience of recalling a vivid death-related memory should positively relate to feelings of authentic becoming. Across three studies, vividness of a mortality experience was positively related to feelings of authentic living and intrinsic goal aspirations. Critically, results also indicated that death rumination, the extent to which participants reported pervasive and repetitive thoughts of death, was negatively associated with authenticity and intrinsic aspirations. These findings indicate that feelings of authentic living are impacted, in part, by how people contemplate life's inevitable end. While all life (authentic or otherwise) ends in death, perhaps, paradoxically, brief vivid contemplation of this fact offers a window to authentic selfhood.

The research surveyed above sheds light on the potential for mortality awareness to stimulate personal growth via heightened intrinsic goal priorities, reduced selfishness, and feelings of authenticity. Research derived from TMT has shown that people react defensively to reminders of mortality, yet, as past existentially oriented philosophers and therapists contended, research also indicates that under certain conditions, contemplating mortality can spur personal growth via greater emphasis on intrinsic rather than extrinsic strivings and increased perceptions that one is living authentically. Regrettably, the conditions under which personal growth can spring from mortality awareness, namely, conscious and vivid (but not ruminative) reflections upon death, presumably, are often avoided. However, as terror management and other death-related research attest, when we suspend defensively averting our eyes to our existential reality and consciously reflect, if only briefly, on our transient state, we avail ourselves the opportunity to trivialize that which may deserve it, and grow as we pursue personally meaningful intrinsic projects in an effort toward authentic becoming.

CONCLUSION

In one of the most famous opening salvos of 20th century literature, Albert Camus (1942/1955) wrote, "There is but one truly serious philosophical problem, and that is suicide. Judging whether life is or is not worth living amounts to answering this fundamental question of philosophy. All the rest...These are games" (p. 3). Is a doomed existence worth the inherent toil flanked by life's beginning and inevitable ending? Humanity, fully aware of inescapable death, must continually answer this question, and the answer is seemingly a resounding "yes." In the teeth of death awareness, humanity is not found, en masse, in a heap of crippling fear or self-abandoned to the abyss. TMT contends that a psycho-social toolkit of coherence, purpose, and feelings of significance sustains us, with relative equanimity, in spite of our fate. In this chapter, we have outlined both how reminders of death impact perceptions of meaning in life and how perceived meaning influences dealings with the specter of death. Death concerns drain perceptions of meaning in life but only when wellsprings of meaning are not engaged. When such constructs are secure or readily deployed, people's perceptions of meaning in life remain unscathed after cognitive brushes with death.

Trusty founts of meaning insulate us from the negative implications of death awareness, but they serve more than a palliative function. This chapter also reveals that our relationship with death awareness is a cantankerous one. Contemplating death can, at times, augment aspects of meaning often considered of the highest order, the "good life": creativity, personal growth, and authenticity. Creative activity promotes exploration of novelty and reduces the stringent, often intolerant, cultural worldview defense that typically follows a

reminder of mortality. While the alienating quality inherent in creativity can foster guilt when death concerns are elevated, MS inspires creative activity that promotes social connectedness or a long-remembered legacy. Reflecting upon death in a manner that specifically illuminates its individual nature can also shift one's focus toward the pursuit of intrinsic, rather than extrinsic, goals, promote prosocial intentions and behavior, and increase appreciation for one's own life. Vivid (but not ruminative) contemplation of death relates positively to feelings of authenticity: living in accord with who one really is.

Given that consideration of our existential predicament under certain conditions can enhance our lives, how do we best go about making the most of our "thrownness" (Heidegger 1927/1962)? This is an important topic for future research. Research exploring such questions will continue to provide germane insights into how we not only manage our existential lot but also utilize our awareness of death in striving to become who we can while we are able. Because, as we all know, authentic human existence stipulates recognition that time is of the essence and that we act accordingly.

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Chapter 15

Existential Neuroscience: A Review and Brain Model of Coping With Death Awareness

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Humans have remarkable intellectual abilities, including self-reflection, abstract thinking, and the ability to mentally travel in time and space. Evolutionary psychology has typically paid much attention to the adaptive value of these and other cognitive abilities, but has somewhat ignored the problems that arose from having these abilities: people often find themselves feeling thrown into the world without protection, struggling with many challenges related to uncertainty, meaning, loneliness, authenticity, absurdity, or responsibility. These existential challenges have inspired philosophers like Albert Camus, Jean-Paul Sartre, Soren Kierkegaard, and Martin Heidegger to found a philosophical direction: existentialism. Much of experimental existential psychology is about describing the psychological maneuvers people take in order to cope with these existential issues (Greenberg, Koole, & Pyszczynski, 2004; Koole, Greenberg, & Pyszczynski, 2006; Pyszczynski, Greenberg, Koole, & Solomon, 2010; Pyszczynski, Sullivan, & Greenberg, 2015).

During the last couple of years, an interdisciplinary branch of research has emerged that aims to bridge traditional philosophical existentialism with neuroscience: existential neuroscience (cf. Quirin & Klackl, 2016). Specifically, existential neuroscience aims to explore the neural correlates and mechanisms of human issues that have typically been dealt with in existentialism (Iacoboni, 2007; Inzlicht, Tullett, & Good, 2011). It places little emphasis on human intellectual abilities themselves, or how consciousness, self-awareness, abstract thought, creativity, and complex decision-making are implemented in the brain. Instead, it is concerned with the side effects of these advanced mental abilities, like disorientation, confusion, and dread that sometimes arise when we apply our complex mental abilities to the world.

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One central issue which results from the ability to self-reflect is the knowledge about the finiteness of life. While both the time at which an individual dies, and what might follow, is uncertain, the fact that death will occur at some point is quite certain. This prospect poses a major challenge to individuals' concepts of meaning, as it highlights the principle futility of an individual's efforts, and might require particular ways of coping, as proposed by terror management theory (TMT). TMT bridges psychology with existentialism, and has become the most influential psychological research approach to the issue of death awareness (Greenberg, Pyszczynski, & Solomon, 1986; Pyszczynski, Solomon, & Greenberg, 2015; Solomon, Greenberg, & Pyszczynski, 1991).

Although existential neuroscience is not only about death awareness, this chapter attempts to shed light on the neural aspects of death awareness, and puts other existential concerns aside. We begin by providing an overview of central assumptions of TMT and the empirical backup it has received, and continue by presenting a review of neuroscientific studies on death awareness. On the basis of existing information about the putative functions of the brain structures involved, especially in the context of self-regulation, we then attempt to integrate the presented findings into a neuroscientific model of death awareness.

TERROR MANAGEMENT THEORY

Humans possess the unique potential to reflect on themselves, including their mortality. As a consequence, they have developed ways to cope with this notion, for example, by adjoining themselves to a cultural, religious, or philosophical worldview (Becker, 1973). TMT is built upon this idea, and research has relied on a number of paradigms to test it. The most influential one is the mortality-salience paradigm (Burke, Martens, & Faucher, 2010; see Chapter 1, this volume). Mortality salience, as a typical invocation of "existential angst," has been induced in various ways. Most studies asked participants directly to contemplate about their own death by responding to two open questions about what will happen after they die. Other studies have used implicit primes of mortality salience, for example, by interviewing participants after having passed a funeral home (Pyszczynski et al., 1996) or by presenting visual death reminders on a computer screen below the threshold of awareness (Arndt, Greenberg, Pyszczynski, & Solomon, 1997). The reasoning behind the paradigm is that individuals will be more prone to bolstering the psychological structures that serve as coping mechanisms against existential anxiety when death is salient, compared to when it is not salient.

TMT proposes two defensive strategies against mortality concerns based on their temporal and psychological proximity (see Chapter 2, this volume). *Proximal* coping with mortality salience refers to the early, immediate reaction to a thought of death. This reaction typically manifests in the form of automatic or even nonconscious, low-level coping mechanisms such as

suppression or repression that have the function to keep unwelcome thoughts out of awareness (Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997; Pyszczynski, Greenberg, & Solomon, 1999). By contrast, distal coping involves higher level, yet nonconscious, identity-related processes: enhancing self-esteem and identifying with cultural worldviews (Arndt, Greenberg, Solomon, et al., 1997). It has been suggested that worldviews convey subjective feelings of permanence and meaning in life, and that self-esteem indicates the degree to which individuals live up to their worldviews and thus experience to be valuable members of their culture. Identification with a particular worldview is therefore viewed as an anxiety buffer against the potential "terror" of mortality. Worldview identification may manifest in a more favorable evaluation of in-group members and a devaluation of out-group members and their worldviews (see Burke et al., 2010). After mortality priming, distal coping responses have typically been observed to be strongest after a certain delay (i.e., about 5–10 minutes later), especially when mortality reminders were perceived explicitly (Pyszczynski et al., 1999), suggesting that they require time to unfold. A third anxiety buffer is provided by close relationships with significant others (see Chapter 10, this volume). This third buffer seems to be less effective in insecurely attached individuals who have not been able to develop a positive working model of the self on the basis of secure parental attachments (Florian, Mikulincer, & Hirschberger, 2002; Mikulincer, Florian, & Hirschberger, 2003).

What role does affect play in these distal coping responses? Mortality awareness inductions are designed to evoke subtle rather than strong forms of negative affect. This may correspond with what existential philosophers have coined "latent angst" (Heidegger, 1962). For example, content analyses of written narratives suggest that mortality awareness induces sorrow and anxiety (Kastenbaum & Heflick, 2010) as well as fear and anxiety (Lambert et al., 2014). Arndt, Allen, and Greenberg (2001) found that mortality awareness elicited by brief visual presentations of the word "death" led to activity of the corrugator supercilii (i.e., the "frowning" muscle), indicating negative affective responding. Others have found death reflection to elicit positive emotions (Cozzolino, 2006) and positive affective bias (DeWall & Baumeister, 2007). A more recent study (Quirin, Bode, Kazén, Luckey, & Kuhl, 2017) measured nonconscious affect more directly using the Implicit Positive and Negative Affect Test (Quirin, Kazen, & Kuhl, 2009). It was found that mortality salience induced via reminders of terror acts led to increases in implicit but not explicit negative affect. Still, none of the above-mentioned studies were able to substantiate a causal role of these affective processes for distal coping, which has led researchers to speculate that it is not the experience of existential anxiety itself but merely the potential to experience it that might trigger mechanisms for coping with death awareness (Greenberg et al., 2003).

In the following section, we provide a review of studies investigating neural correlates of mortality awareness. Except for one study which measured neural responses *after* mortality salience (Agroskin, Jonas, Klackl, & Prentice, 2016; Study 2), all studies assessed neural responses during or in the immediate aftermath of death contemplation or mortality-related stimuli. Although this activation reflects immediate responses to mortality reminders and may thus comprise correlates of proximal coping, these immediate responses also predicted distal coping in at least a few studies. Therefore, the reader should keep in mind that it is likely that such early brain responses may also constitute precursors of distal coping.

Neuronal Correlates of Mortality Awareness

Amygdala

The amygdala (Fig. 15.1, 1) is part of the limbic ("emotional") brain and is implicated in evaluating the motivational relevance or "salience" of a stimulus. It is activated particularly when a stimulus is evaluated as a potential threat (Cunningham & Brosch, 2012; Kensinger & Schacter, 2006). The amygdala is part of the so-called salience network (Menon, 2015), an attentional network particularly responsive to novelties, urgencies, and threats (Seeley et al., 2007; see also Tops, Quirin, Boksem, & Koole, 2017). The salience network additionally includes the anterior cingulate cortex (ACC) and the insula (see later). As such, this network can be conceived of as a large-scale network (Bressler & Menon, 2010), i.e., a coalition of that interact to produce a certain psychological function such as orienting attention to important (i.e., salient) intra- or extrapersonal events.

Quirin et al. (2012) found increased amygdala activation when participants answered yes–no questions about fear of death as compared to questions about fear of dental pain. Yanagisawa et al. (2015) found mortality-related words to activate the amygdala only among people reporting low self-esteem. In the latter study, those with high self-esteem also had stronger connectivity between ventrolateral prefrontal cortex (VLPFC) and the amygdala. This suggests that in this study, self-esteem might have exerted soothing effects via prefrontal regulation of emotional responses to mortality reminders. Increased amygdala activation in response to mortality threat is compatible with observations of mortality-related stimuli eliciting large late positive potentials (Klackl, Jonas, & Fritsche, 2017; Klackl, Jonas, & Kronbichler, 2013), which are believed to reflect motivated attention (Hajcak, Dunning, & Foti, 2009). Other studies have not reported amygdala activation in response to mortality reminders (Han, Qin, & Ma, 2010; Klackl et al., 2017; Klackl, Jonas, & Kronbichler, 2014; Nail & McGregor, 2009; Shi & Han, 2013). Considering that these studies have used different ways of manipulating mortality awareness, whether or not the amygdala is activated may, in part, depends on the experimental paradigm and the stimuli used.

Anterior Cingulate Cortex

The ACC (see Fig. 15.1, 2) lies at the intersection of the limbic system and the neocortex and is implicated in several psychological functions such as discrepancy detection (or "conflict monitoring"), willpower, decision-making, preactivating motor systems, as well as both experiencing and regulating affect and pain (Botvinick, Braver, & Barch, 2001; Shackman et al., 2011; Stevens, Hurley, & Taber, 2011). In the above-mentioned studies (Klackl et al., 2017; Quirin et al., 2012), the ACC responded more strongly to the induction of mortality than to pain salience. Klackl et al. (2014) additionally found that ACC responses to death reminders were pronounced in individuals with relatively low self-esteem.

As mortality salience interferes with the basic need to survive as well as with needs for control (Fritsche et al., 2013) and meaning (Proulx, Inzlicht, & Harmon-Jones, 2012), ACC activity in these studies might result from the detection of a discrepancy between the desire to survive and the knowledge that life is finite (Botvinick et al., 2001; Egner, 2011; Oliveira, McDonald, & Goodman, 2007; Ridderinkhof, Ullsperger, Crone, & Nieuwenhuis, 2004; Shackman et al., 2011; Stevens et al., 2011). However, ACC activity in response to mortality reminders might alternatively, or additionally, relate to the experience and regulation of anxiety. Therefore, future research would be helpful to clarify the ACC's exact role by relating its activity to direct or indirect psychological measures of discrepancy detection, anxiety experience, and anxiety regulation.

Insula

Like the ACC, the insula (see Fig. 15.1, 3) is implicated in affective processing (and a part of the salience network as well). More specifically, it has been proposed to play a vital role for interoceptive awareness of affect, somatic sensations, and pain (Craig, 2002, 2009), including the psychological pain of social rejection (Eisenberger & Lieberman, 2004). Han et al. (2010) as well as Shi and Han (2013) found reduced (rather than increased) activity in the insula when participants viewed mortality-related as compared to neutral and unpleasant words. Likewise, subsequent studies from other labs also found less activity in response to death-related, but not death-unrelated unpleasant stimuli (Klackl et al., 2014) or dental pain-related stimuli (Klackl et al., 2017).

In line with the notion that the insula mediates interoceptive awareness (Craig, 2002, 2009), Shi and Han (2013) suggested that reduced insula activity in response to death awareness may reflect avoidance of self-awareness. The latter phenomenon has been consistently observed in terror management studies. For example, mortality awareness rendered participants to spend less time in mirrored cubicles (Goldenberg et al., 2006), or to write shorter stories when they prompted an internal as compared to an external focus of attention (Arndt, Greenberg, Simon, Pyszczynski, & Solomon, 1998; Study 2).

Avoiding self-focused states might represent a pragmatic way to evade the existential plight created by mortality reminders. Klackl et al. (2014) found that reduction in insula activity in response to mortality reminders was more pronounced in individuals with high self-esteem. If insula deactivation is indeed related to self-avoidance, this result would suggest that self-avoidance is more prominent among individuals with high self-esteem. However, additional research is required as this finding contrasts results from a psychological study showing that individuals with low rather than high self-esteem tend to reduce self-awareness in response to mortality salience (Wisman, Heflick, & Goldenberg, 2015).

Notably, in a study unrelated to mortality awareness, social rejection led to insula activation (rather than deactivation), which itself was related to a subsequent drop in self-esteem (Eisenberger, Inagaki, Muscatell, Byrne Haltom, & Leary, 2011). Hence, the more the insula was active, the steeper the drop in self-esteem. Consequently, insula deactivation in response to mortality threat may constitute a buffer against self-esteem loss in response to mortality threat. It may also be speculated whether insula deactivation finally might initiate delayed self-esteem striving as a distal coping mechanism. However, there is no direct empirical evidence for this relationship yet.

Ventrolateral Prefrontal Cortex and Left–Right Lateralizations

The VLPFC appears to show strong hemispheric specialization with respect to a number of psychological functions, some of which appear to be particularly relevant in the context of mortality salience. Specifically, the right VLPFC (Fig. 15.1, 4) is implicated in orienting toward salient (e.g., threatening) stimuli, as well as ensuing cognitive and motor control (Hampshire, Chamberlain, Monti, Duncan, & Owen, 2010). Additionally, this area has been found to be implicated in emotion regulation (Morawetz, Bode, Derntl, & Heekeren, 2017), as for example indicated by increased interactions (connectivity) between VLPFC and amygdala in response to emotional stimuli (Morawetz, Bode, Baudewig, & Heekeren, 2017; Morawetz et al., 2016). As such, this area may convey a double function of both generating and regulating emotions. It is also likely that activation of this area causally underlies shifts toward right-frontal activity in electroencephalography (EEG) as a marker of avoidance motivation (Tops et al., 2017).

By contrast, the left VLPFC (Fig. 15.1, 5) is implicated in worldview (schema) maintenance. It helps the individual become familiar with novel experiences by categorizing and conceptualizing them (Plailly, Tillmann, & Royet, 2007; Tops, Boksem, Quirin, Ijzerman, & Koole, 2014). This includes attempts to make meaning out of, reappraise, and integrate negative experiences into the "self," i.e., into persistent internal schemata of oneself as a person and worldviews in general (Quirin, Kent, Boksem, & Tops, 2015).

This view is consistent with the idea that the left cortex generates explanations for novel experiences (Gazzaniga, 2000) and maintains existing worldviews (Ramachandran, 1995).

In research on death awareness, involvement of the right and left VLPFCs was reported in several studies. Specifically, Yanagisawa et al. (2013) subliminally presented words related to death versus pain and found increased activity at near-infrared spectroscopy sensors positioned over the right VLPFC. In an functional magnetic resonance imaging (fMRI) study, Klackl et al. (2014) found that bilateral VLPFC (and ventromedial PFC: VMPFC, Fig. 15.1, 6) activation in response to death-related (as compared to other unpleasant) stimuli was related to reduced trait self-esteem, i.e., in participants who appear to show a stronger urge of coping with death awareness (Harmon-Jones et al., 1997; but see also Burke et al., 2010). Accordingly, it is likely to assume that mortality-related stimuli activated salience and worldview maintenance systems to a stronger degree than it was the case for threats unrelated to mortality. The finding of VMPFC (as opposed to VLPFC) activation is interesting as well, as this area is involved in the representation of self-concepts (Northoff et al., 2006). The following studies found relationships between immediate brain responses to death awareness and distal coping. One fMRI study (Yanagisawa et al., 2015) found that individuals with high self-esteem showed stronger connectivity between right ventrolateral PFC and the amygdala in response to death awareness, which predicted less subsequent distal coping after the in-scanner task. As connectivity between ventral PFC areas and amygdala is related to affect regulation (Banks, Eddy, Angstadt, Nathan, & Phan, 2007), it is likely to assume that the present finding reflects the involvement of VLPFC in proximal coping, and that high self-esteem individuals more efficiently regulate their emotions when processing mortality stimuli. The results also suggest that the more connectivity between VLPFC and amygdala people had, the less they engaged in delayed, symbolic coping with mortality salience.

Agroskin et al. (2016) used EEG to investigate frontal alpha asymmetry in a 90-second resting interval after a mortality salience manipulation. Left and right shifts in frontal alpha asymmetry may in part stem from the prefrontal cortex, and have been associated with approach versus anxiety/withdrawal, respectively. Mortality salience increased right-frontal activation among people with a high need for cognitive closure (i.e., individuals who prefer simple, unambiguous, and predictable environments, and might thus be especially vulnerable to existential threat, see Chapter 5, this volume). Additionally, in individuals high in need for cognitive closure, right-frontal activation mediated the effects of mortality awareness on distal coping, which was interpreted as an avoidance of cultural novelty. This result is compatible with the notion that the right VLPFC is related to threat detection and regulation and the findings reported earlier, as well as with research

interpreting asymmetry to the right-frontal cortex as being linked to anxiety and behavioral inhibition (Harmon-Jones, Gable, & Peterson, 2010; Sutton & Davidson, 1997; Wacker, Chavanon, Leue, & Stemmler, 2008; Wacker, Heldmann, & Stemmler, 2003). As argued earlier, rightward shifts in frontal EEG activity might be attributed to the activation of the right VLPFC as a structure that is relevant in the processing and regulation of salient stimuli (see also Quirin, Gruber, Kuhl, & Düsing, 2013, for evidence that right ventral PFC can be a source of frontal asymmetry).

Two studies measured brain activity while participants watched pictures immediately after the presentation of death-related stimuli. Specifically, Graupmann et al. (2013) presented pictures of objects related to own cultural (German) values versus neutral pictures. These pictures were preceded by death-related word pairs (i.e., death—poison), meaningless word pairs (i.e., duck—boomerang), or meaningful word pairs (i.e., goat—cheese). When preceded by death-related word-pairs, cultural pictures elicited more left VLPFC (inferior frontal) activation than meaningless word-pair primes. Silveira et al. (2014) presented attractive opposite-sex versus same-sex faces which were either preceded by death-related words or a blank screen. Opposite-sex faces preceded by death-related words also led to increased activity in the left VLPFC, as well as in the left anterior insula in addition (which is, beyond others, related to the experiencing of emotional feelings, including sexual arousal; e.g., Craig, 2009). Although the authors of both studies interpreted this left frontal activity as reflecting approach motivation (Coan & Allen, 2003, 2004; Jonas et al., 2014), it may not be excluded that it reflects the maintenance of (familiar) worldviews as the left VLPFC is implicated in this process.

Still, we agree that whenever attractive objects or persons are available, individuals might readily use them as a coping resource (e.g., to distract oneself from mortality awareness) and show corresponding approach tendencies toward these objects or persons. For example, romance and partner attachment can be used to alleviate the threat of death awareness (Greenberg, Porteus, Simon, Pyszczynski, & Solomon, 1995; Mikulincer et al., 2003). However, it appears that this type of coping (cf. reactive approach; McGregor, Prentice, & Nash, 2009) might be more strongly related to the left dorsolateral prefrontal cortex (DLPFC) (see Fig. 15.1, 7) rather than VLPFC (Berkman & Lieberman, 2010; Pizzagalli, Sherwood, Henriques, & Davidson, 2005; Quirin, Meyer, et al., 2013). Consequently, depending on the context, left frontal activity in response to mortality awareness might reflect different psychological mechanisms such as familiarity seeking (e.g., in familiar worldviews) or approach motivation (e.g., in the presence of objects that can be approached for distraction or elevation of positive affect).

INTEGRATING THE FINDINGS: A NEUROSCIENCE MODEL OF COPING WITH DEATH AWARENESS

The evidence on neural correlates of mortality awareness is yet sparse and extant research is still necessary to replicate first results and to answer remaining questions. Still, the results existing so far are compatible with what is known about neural mechanisms of self-regulation processes and respective models (Jonas et al., 2014; Kuhl, 2000; Quirin, Tops, & Kuhl, 2018; Tops, Boksem, Luu, & Tucker, 2010; Tops et al., 2017). Therefore, we now attempt to integrate existing neuroscientific findings of mortality salience into a preliminary brain model of coping with death awareness (see Fig. 15.1). Among others, we will discuss later whether and in which way such a model may be specific for mortality threat and in which way it may not be.

Like other models in the field (Jonas et al., 2014; McGregor, 2006), the brain model of death awareness suggests that death-related cognitions, probably like any other salient threats, first become detected by a *salience system* (or "discrepancy system") that signals discrepancies from a default state of low arousal in terms of relaxation and environmental predictability (Seeley et al., 2007). Death awareness constitutes a discrepancy for the human being at least in two regards. First, with respect to the basic need to survive and, second, with respect to the impossibility to conceive and imagine one's own death.

A central part of the salience system is the amygdala, which responds to salient stimuli and situations, and evaluates them with respect to their potential danger. In addition, the dorsal ACC (in cooperation with the right VLPFC) responds to and dampens threat-related amygdala activation and channels it toward the preparation or even initiation of optimal action. The right VLPFC is implicated in cognitive control. Specifically, it controls attention toward salient stimuli but additionally regulates concomitant arousal and affect. Threat regulation provided by the ACC and the right VLPFC can occur relatively automatically and effortlessly, i.e., individuals may not be aware of this regulatory process. As this process is typically automatic and as right VLPFC activation has been found in immediate response to mortality awareness, the right VLPFC may be implicated in proximal coping as the left (more so than the right) VLPFC is associated with worldview maintenance in terms of familiarity processing, categorization, assimilation, and symbolic processing (Plailly et al., 2007; Tops, Boksem, et al., 2014), the left VLPFC can be assumed to support distal coping in terms of identification with cultural worldviews (see earlier), which can engender transient self-esteem boosts.

Coping does not always need to be abstract and symbolic in nature (Jonas et al., 2014). As such, another form of coping which is concrete but nonsymbolic at the same time, refers to approaching external incentives such

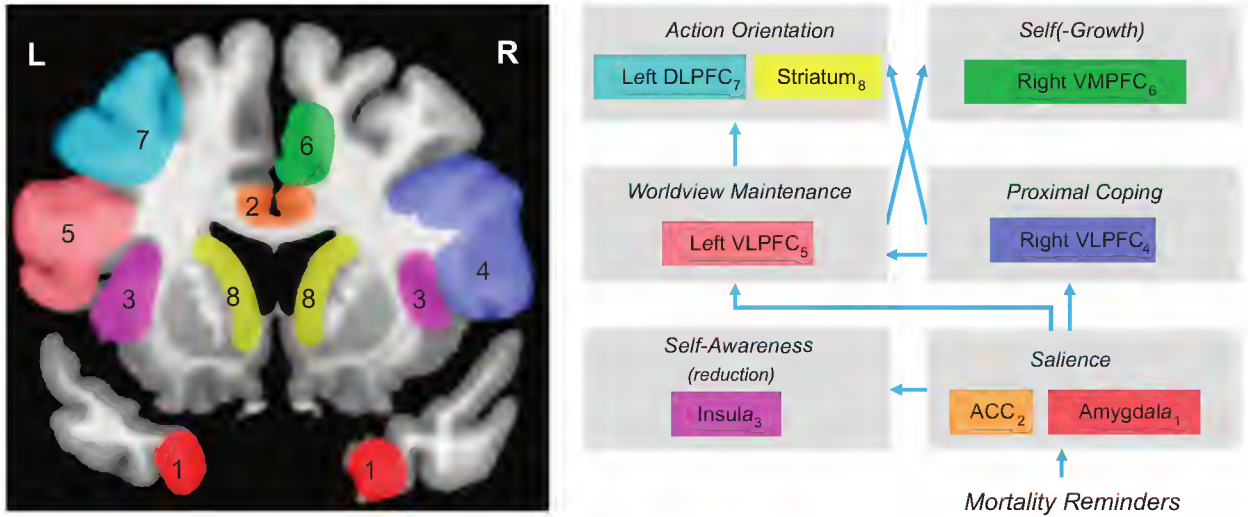


FIGURE 15.1 A neuroscience model of coping with death awareness. Mortality reminders activate brain regions associated with salience and discrepancy detection such as amygdala and ACC. Detection of mortality threats engenders decreased activation in the insula, a region implicated in self-awareness. Mortality threats also activate regions in the prefrontal cortex implicated in different types of coping. Specifically, the right VLPFC is implicated in immediate and automatic self-regulation, and is thus likely to support proximal defense mechanisms such as repression. The left VLPFC is implicated in familiarity processing and semantic categorization and is thus likely to support the maintenance of worldviews (see text, for evidence). By contrast, the left DLPFC is implicated in amplifying signals associated with goal pursuit (action orientation), which can be supported by the activation of the striatum adding a motivational (e.g., appetitive) component. The right VMPFC constitutes a neural correlate of integrated self-representations including identities. As there is no empirical data yet, we only hypothesize that this area might be particularly active whenever mortality threats lead to accommodative processes conveying the integration of death-related experiences (self-growth).

as romantic experiences, sex, attachments, drugs, food, or other pleasurable experiences that promise immediate, momentary satisfaction, or ego/power boosts in order to distract individuals or help them overcome existential angst in the short run (for an overview, see Pyszczynski, Solomon, et al., 2015). Based on research on behavioral approach motivation (e.g., Harmon-Jones et al., 2010) and integrative models of self-regulation (Tops et al., 2010), it is likely to assume that approach-motivated striving for rewards as a particular type of affirmative, palliative coping involves parts of the left dorsal control system including the left DLPFC (Fig. 15.1) and the left anterior insula (Tops et al., 2017). In addition to left DLPFC activation, behavioral approach motivation also involves parts of the striatum (Fig. 15.1, 8), such as the caudate nucleus (e.g., Yuan et al., 2017). Whereas the left DLPFC may reflect the cognitive aspect of approach motivation in terms of action (or goal) orientation, the striatum may reflect affective and habit-related aspects. Accordingly, striatum (specifically caudate nucleus) activity in response to death awareness (Quirin et al., 2012) may constitute an additional marker of craving for attachment figures such as parents or romantic partners (Tops, Koole, Ijzerman, & Buisman-Pijlman, 2014; see also the findings from Silveira et al., 2014 reported earlier).

The VMPFC, which is part of the right dorsal control system (Tops et al., 2014, 2017), is an area relevant for self-representations (D'Argembeau et al., 2007; Northoff et al., 2006) and is considered a crucial aspect of the integrated self, a structure that processes self-representations and other information in a holistic, contextualized way (Quirin et al., 2018). This type of processing is necessary for novel experiences to be integrated with existing schemata of experiences and worldviews (Quirin et al., 2018).

Therefore, this area may be relevant whenever individuals attempt to integrate death-awareness experiences (Cozzolino, 2006) rather than to merely defend them in a palliative way by affirming existing (familiar) self- or worldview schemata or by quickly seeking pleasure. Individuals may be more likely to integrate the notion of their finiteness when inevitably and continuously confronted with it (e.g., as victims or helpers in the context of trauma, chronic mortal disease, or near-death experiences. It is likely to assume that such a growth-oriented integration process does not exclusively capitalize on the functioning of the VMPFC (and other regions of the dorsal control system contributing to context processing), but necessitates its interaction with those areas providing analytic reflection and conceptualization such as the left VLPFC (Düsing, Tops, Radtke, Kuhl, & Quirin, 2016; Quirin et al., 2015; Tops & Boksem, 2011; Tops, Boksem, et al., 2014; Tops et al., 2017).

Not least, the studies reported earlier found reduced activity of the insula in response to death awareness. Reduced activity of the insula, which is typically involved in interoceptive awareness, might constitute a meaningful evolutionary emergency mechanism in "the face of death" that directs

attention away from internal emotions and body sensations but the environment and may buffer against a subsequent loss of self-esteem (Eisenberger et al., 2011). This might be interpreted in a way that the *interoceptive self* becomes bypassed, which may serve the function of directing an individual's resources toward dealing with potential external challenges and dangers (e.g., fight or flight). This finding corresponds with findings of self-awareness avoidance after mortality threats in psychological studies (Wisman, 2006; Wisman et al., 2015). Notably, it may be possible that reduced insula ("interoceptive") activity along with automatic threat regulation provided by the ACC and the right VLPFC constitutes a major reason for angst to remain latent in many studies (i.e., for absent findings of changes in self-reported anxiety in response to mortality threats; e.g., Burke et al., 2010). This, however, does not exclude the possibility that for some individuals, e.g., for those with high levels of interoceptive emotional awareness or self-access (cf. Quirin & Kuhl, 2018), automatic anxiety may be consciously accessible (see Lambert et al., 2014, for findings of self-reported fear).

Several of the empirical findings described earlier such as reduced insula activity ("reduced self-awareness"), left VLPFC activation ("social norms"), and left DLPFC along with caudate nucleus activation ("approaching others or pleasurable objects") may all be interpreted as directing attention away from the self (VMPFC), which may correspond with what Heidegger (1962) described as a typical defense of latent angst deriving immanently from vulnerably "being thrown in the world" or the "Dasein" (being-there/being oneself). In Heidegger's words (see also Kuhl, 2001), individuals cope by switching to the "Mitsein" (social world and norms) or the "Zuhandenheit" (handiness: world of objects).

DISCUSSION AND OUTLOOK

We provided an overview of neuroscientific studies on proximal ("immediate") and distal ("delayed") responses to mortality salience and related the findings to results of psychological studies on mortality salience. We tried to integrate the findings into a *preliminary* neuroscientific model of death awareness. Although it is possible to interpret the neuroscientific results on mortality awareness in more than one way, our knowledge about the functions of brain areas helped us to generate hypotheses about the psychological micro-mechanisms that may underlie coping with mortality awareness and potentially stimulate both future neuroscientific and psychological research. We will now discuss the issue of specificity, as well as a number of issues we consider as relevant for future research.

Specificity of findings. A crucial question refers to whether or in which way the presented neuroscientific model is unique for the threat of mortality awareness. In fact, although each finding reported earlier comes from

experiments that investigated mortality threat while controlling for other types of threat, the neuronal model of mortality awareness capitalizes on knowledge about self-regulation processes derived from studies investigating neural correlates of mortality-unrelated threats. Like other models of threat processing (Jonas et al., 2014; Jonas & Mühlberger, 2017), the present model may function as a general model of coping with different kinds of threats. So, in which way could mortality threats possibly be distinct in this model?

First, it is likely to assume that mortality salience might be special with respect to the temporal dynamics in which brain activations occur. Specifically, differential temporal dynamics may lead to the emergence of different mechanisms such as distal coping with mortality threat that may not depend on spatial activation alone. Second, different subregions of certain brain regions often serve different psychological functions. For example, different amygdala circuits are involved in freezing, anxiety, and social behavior (Janak & Tye, 2015). Mortality awareness might activate subregions (e.g., of the amygdala or the VLPFC) different from those activated by other types of threat. Unfortunately, the evidence on neural correlates of mortality awareness is too sparse for a differentiation of subregions. The finding of reduced (rather than increased) insula activation currently appears to be unique for mortality salience, at least when contrasted with the given control conditions.

Hemisphere laterality in EEG. As mortality awareness engenders self-regulation processes, some research teams attempted to explore hemisphere lateralization over the frontal cortex using EEG. As reported earlier, left-lateralized activity over the frontal cortex measured with EEG can reflect different coping processes such as approach motivation (dorsal) or reflection and meaning making (ventral). Therefore, future research is needed that analyzes the brain source of activation found in the EEG as well as direct relationships with psychological measures of approach motivation, reflection (and meaning making), and other relevant processes in the context of mortality awareness.

Latent angst. We have outlined in the beginning that most research on mortality awareness did not find changes in self-reported, manifest anxiety. However, evidence from psychological studies reported in the beginning suggests that mortality awareness might induce anxiety on a nonconscious, "latent" level. These findings were amended by neuroscientific studies reported earlier, which found neural responses to mortality awareness in areas typically related to anxiety and fear (such as the amygdala). Neuroscientific findings even demonstrate that such activation mediates distal coping (Agroskin et al., 2016). Still, additional research is needed to corroborate these findings.

Control conditions. Many studies on mortality awareness relied on control conditions that were not matched for valence or arousal. This is particularly aggravated as different types of control conditions were used, such

as dental-pain imagination, watching TV, failing an exam, public speaking, and social exclusion, albeit this provides ecological validity for the mortality salience hypothesis at the same time (Burke et al., 2010). Future neuroscientific studies should thus control for valence and arousal (but also for other parameters such as personal relevance, familiarity, and imageability) to strengthen the claim that the findings are specifically related to mortality awareness.

Moderating personality variables. We also believe that neuroscientific research on mortality salience should consider individual differences over and above self-esteem, such as attachment styles (Florian & Mikulincer, 1998), mindfulness (Niemiec et al., 2010), and emotion-regulation abilities (Quirin, Bode, Luckey, Pyszczynski, & Kuhl, 2014). For example, attachment styles moderate coping effects of mortality threats in a way that securely attached individuals increase intimacy, whereas insecurely attached individuals coped by identifying with cultural worldview defense (Mikulincer & Florian, 2000; Smith & Massey, 2013). Correlations found with these or other personality variables would provide some clarification or at least suggestions for the psychological interpretations of regional activations. Specifically, these individual differences may differentially moderate effects of mortality threat on the activation of the caudate nucleus (as typically involved in attachment), the insula (as involved in social rejection), and VLPFC (as involved in emotion generation and regulation).

CONCLUSION

The question of how existential threat impacts various aspects of human behavior is a crucial element of TMT and of existential philosophical perspectives as well. In this chapter, we reviewed the pioneering studies that explored the neural correlates of mortality awareness and the many ways people cope with it, and derived a neuroscientific model of death awareness. Although highly preliminary, we hope that the review of evidence and ideas provided by this chapter will inspire future psychological and neuroscientific research, which itself would contribute to further shaping this exciting and promising new field of investigation: existential neuroscience.

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Chapter 16

Physical Health Under the Shadow of Mortality: The Terror Management Health Model

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INTRODUCTION

The majority of research derived from terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986) tends to conceptualize the threat of death as an abstract inevitability rather than a tangible reality which people confront on a daily basis. As the pages of this volume attest, such conceptualizations have been extremely generative for understanding myriad ways that the nebulous specter of mortality impacts human social behavior as people seek valuable lives of enduring significance. However, there are many forums through which we regularly maintain a more direct and intimate relationship with what Eliot (1936) referred to as "the skull beneath the skin" (p. 60). News reports featuring shootings, bombings, and natural disasters are all too frequent and alarming as to the fragility of life; not just as some abstract future event, but as a concrete possibility on any given day. And, these are just the tip of the proverbial iceberg. Consider that every morning we wake up (hopefully), head to the bathroom, and see in the mirror a nagging partner that will never leave us at the altar: our body. With aches, pains, sores, illnesses, rashes, palpitations, clots, blockages, cramps, moles, and lumps our body confronts us with the reality that maintaining physical health will always be mired under the shadow of mortality.

Building from the classic analysis of Becker (1973), one of the foundational assumptions of TMT is that human beings, like all life, possess a natural proclivity toward survival. It follows that people should behave in ways that promote their physical health to have a better chance at extending their individual lives. And in many respects, people do an admirable job. For example, Americans in 2015 possessed 55 million memberships to 34,000

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exercise facilities (International Health, Racquet, & Sportsclub Association, 2015; though note a vast majority of members, after signing up, don't visit the gym more than a few times a year), while spending $2.6 trillion on personal health care (National Center for Health Statistics, 2015). These and other advances in healthy living and certainly medical science have contributed to increasing the average American life expectancy by 8 full years since 1970 (Xu, Murphy, Kochanek, & Bastian, 2016). At the same time, people often engage in unhealthy behaviors, and even behaviors that directly increase their risk of an earlier death. In the United States alone, an estimated 36.5 million adults currently smoke cigarettes (Center for Disease Control, 2015), and nearly half of the US female college population report using indoor tanning which is now, like cigarettes, considered a type 1 carcinogen (Hillhouse et al., 2016). Such statistics suggest an irony of sorts. How can we reconcile a deeply rooted psychological aversion to death with the prevalence of risky if not death-provoking lifestyles (see also Chapter 24, this volume)?

Ironies, at times, can be illuminating. Lewin's (1951, p. 169) classic quote, "There is nothing so practical as a good theory," is often taken to suggest that a theory can inform the complexities involved in everyday social behavior. We will suggest a theory about the role of mortality awareness in health decision-making that can help to do just that. But, there is also nothing so *theoretical* as a practical *problem* (Rothman & Salovey, 2007). A practical problem such as ironic self-defeating health decisions pushes us to explore the nuanced dynamics that operate in everyday life and might otherwise be glossed over by more generalized theorizing. With regard to TMT, the health context invites the opportunity to consider not just how navigation through an existential world impacts health decision-making, but also how health decision-making illuminates the complex stage on which existential processes play out.

Thus, this chapter examines the terror management health model (TMHM; Arndt & Goldenberg, 2017; Goldenberg & Arndt, 2008) to better understand the nexus between terror management processes and health. We introduce the theoretical model that bridges these two areas of inquiry and follow by considering some of the research it has inspired. This research has examined such different health domains as sun safety, fitness and exercise, disordered eating, health screening, risk assessment, smoking and cessation, and alcohol/drug use that, taken together, point to the potential ubiquity of terror management processes in health decisions and behavior. This chapter will then step back to consider how the study of terror management enhances understanding of health decision-making, how an application to health decision-making enhances understanding of terror management, and future directions for research exploring this intersection between health and death.

TERROR MANAGEMENT HEALTH MODEL

Motivational Dualities in Health Psychology

Prior to the development of the TMHM, the landscape of health psychology research reflected, to some degree, two distinct pastures. On the one hand, there has been a focus on health-oriented cognitions. Traditional models adopted an expectancy-value perspective of rationally oriented decision-makers whose primary concern was the reduction of health risk (e.g., Rosenstock, 1974). Further insight that people also regulated accompanying distress (e.g., Cameron, 2003; Leventhal, Meyer, & Nerenz, 1980) helped to inspire research showing various ways in which people bias their risk assessment so as to minimize *perceptions*, rather than the reality, of vulnerability (e.g., Jemmott, Ditto, & Croyle, 1986; Kunda, 1987). Notable lines of research also recognized the importance of such factors as perceptions of efficacy and severity in influencing whether people respond adaptively or maladaptively to health information (Prentice-Dunn & Rogers, 1986; Witte & Allen, 2000). One commonality among most of these perspectives was an emphasis on cognitions more directly related to the health concerns. In the language of Vallacher and Wegner's (1987) action identification theory, the key factors were at proximal levels of abstraction relative to the health context.

The other growing pasture in the landscape of health psychology research has focused on the influence of more distal, self-oriented motivations; generally pertaining to esteem and presentational appeal (e.g., Leary, Tchividijian, & Kraxberger, 1994), but also including self-consistency (e.g., Stone, Aronson, Crain, Winslow, & Fried, 1994), identity and other cultural beliefs (e.g., about racial or ethnic group; Oyserman, Fryberg, & Yoder, 2007), and increasingly in recent years, affirmations of self-integrity (e.g., Epton, Harris, Kane, van Koningsbruggen, & Sheeran, 2015). These lines of work led to insights about how people often engage in a variety of health-relevant behaviors not so much for reasons pertaining to health, but to satiate underlying motivations such as those for esteem, integrity, and coherence. Interventions capitalize on these insights, showing for example, that targeting the appearance and esteem aspects of sun exposure can be especially effective ways of encouraging safe sun practices (e.g., Jackson & Aiken, 2006; Mahler, Kulik, Gibbons, Gerrard, & Harrell, 2003). What we would like to highlight at this point is the potent influence of motivational factors of more distal relevance to the health context. They are conceptualized to be of distal relevance to health decisions because, in contrast to the direct relevance of proximal factors such as health optimism, esteem contingency factors are often only indirectly related to the health context.

Despite the growing recognition of different motivations underlying health decisions, what was largely missing was a bridge between these two

areas of health- and self-motives, and a unifying framework for understanding when one or the other might be more or less operative. The TMHM offers one such bridge, introducing the prospect of death as a key catalyst that influences the strength of health- and self-oriented motivations.

Death Awareness as Integrative Catalyst

The foundation for the TMHM is derived from the dual defense model of TMT (see Chapter 2, this volume; Pyszczynski, Greenberg, & Solomon, 1999). The dual defense model distinguishes between the implications of conscious and nonconscious processing of death-related thought for differing motivations. In brief, conscious thoughts about death are posited to result in what are termed *proximal* defenses that function to help circumvent distress by removing death thoughts from focal awareness (e.g., through suppression; Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994). The term proximal is used to capture the idea that the prospect of death is engaged relatively more directly. In contrast, when thoughts of death are outside of conscious awareness but highly accessible, *distal* defenses function to bolster the self-esteem of the individual and/or help maintain faith in a meaningful, shared cultural worldview (e.g., Greenberg, Arndt, Simon, Pyszczynski, & Solomon, 2000). These are the reactions that have received the lion's share of attention in TMT research with their implications for esteem maintenance, prejudice, group identification, and so forth. The term distal is used to connote that death is engaged more indirectly, and concerns are attenuated by affirmation of those values and beliefs that offer some form of symbolic if not literal death transcendence.

The striking parallel between proximal and distal motivational factors influencing health decisions and the proximal and distal defenses against awareness of death inspired the TMHM (Fig. 16.1). The model begins with the assumption that health-relevant contexts themselves have the potential to spark both conscious and nonconscious death-related ideation. The model then integrates insights about how people manage conscious and nonconscious death-related cognitions with the recognition that health decisions can be influenced by concerns central (or *proximal*) and more tangential (or *distal*) to the health context. The foundational idea is that when mortality concerns are conscious, health decisions are largely guided by the proximal motivational goal of reducing perceived vulnerability to a health threat and thus concerns about mortality. In contrast, when mortality cognition is active but outside of focal attention, health-relevant decisions are guided by distal motivational goals concerning the symbolic value of the self.

Although we focus shortly on some of the research the TMHM has inspired, an example may help to illustrate how conscious and nonconscious thoughts can engage different motivations that in turn have different implications for health decision-making. In Routledge, Arndt, and Goldenberg

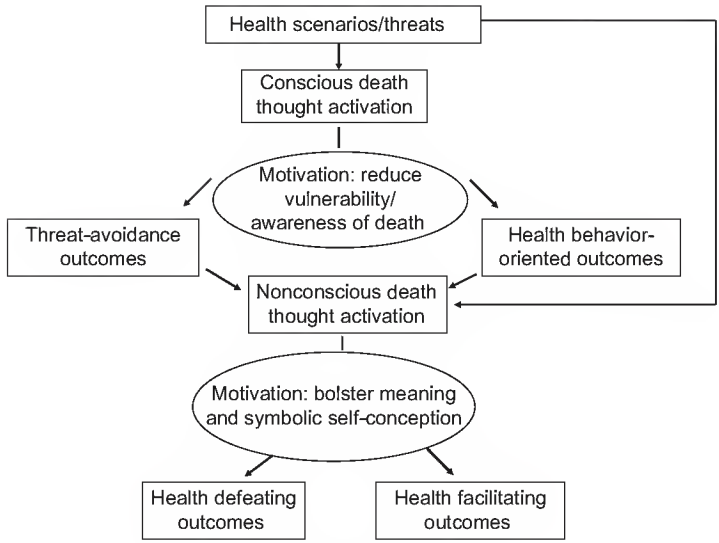


FIGURE 16.1 A terror management health model.

(2004), female participants who indicated during a pretest that tanned skin was important to their self-esteem were instructed to write about mortality or an aversive control topic (see Chapter 4, this volume, for a discussion of TMT methods). Half of the women were then immediately given the opportunity to rate their interest in buying various sunscreen products that ranged in sun protection factors (SPF). The other participants saw the same materials, but were given the product rating after a neutral delay task (i.e., completing an innocuous puzzle). As described in Chapter 2, this is a validated procedure that enables researchers to infer that death-related cognition is more (i.e., no-delay condition) or less (i.e., delay condition) conscious (see, for example, Hayes, Schimel, Arndt, & Faucher, 2010; Steinman & Updegraff, 2015). Those reminded of but not distracted from mortality showed an increased preference for high SPF products relative to the control condition, suggesting attention to protecting oneself from a health risk. In contrast, those reminded of mortality but then given distracting materials were less interested in higher SPF products than those in the comparison conditions, suggesting attention to the appeal of tanned skin.

This study provides an example of how conscious concerns with mortality might elevate the motivational importance of reducing perceptions of vulnerability, whereas nonconscious concerns with mortality might elevate the motivational importance of social and esteem-based appeal even at the potential cost of physical health (i.e., greater risk of skin cancer). This in turn sets the stage for the more focused lines of inquiry we turn to next.

AN OVERVIEW OF TMHM RESEARCH

The Link Between Health and Death

As terror management research began to unfold over the years, growing insights emerged about the variety of situations that have the potential to activate cognitions about mortality (i.e., death thought accessibility; see Hayes et al., 2010). The TMHM focuses this insight to propose a range of different health conditions can lead people to think about death. One health domain particularly yoked to death is cancer. As a leading cause of death, it is perhaps not surprising that one population-level survey found more than 60% of respondents perceived cancer as a death sentence (Moser et al., 2014). Experimental research buttresses this conclusion. Confronting people with screening exams and related procedures (e.g., mammogram), presenting them with risk information pertaining to smoking or sun exposure, having them write about the prospect of cancer, or even exposing participants to subliminal presentations of the word "*cancer*" can all, at least subtly, increase cognitions about death (Arndt, Cook, Goldenberg, & Cox, 2007; Cooper, Goldenberg, & Arndt, 2014; Goldenberg, Arndt, Hart, & Routledge, 2008; Hansen, Winzeler, & Topolinski, 2010).

Although the threat of cancer might be an especially robust elicitor of death-related concerns (perhaps partly due to widespread conceptions about its uncontrollability and fatality; Powe & Finnie, 2003), it is certainly not the only health condition with such reverberations. For example, studies find that writing about AIDS (Grover, Miller, Solomon, Webster, & Saucier, 2010) appeals about consequences of binge-drinking (Jessop & Wade, 2008), and even exposure to insurance advertisements and logos (Fransen, Fennis, Pruyn, & Das, 2008) increase death thought accessibility.

Crucially, some studies find that making salient these health domains results in less proactive health intentions such as getting cancer screenings, visiting physicians for checkups, or performing breast self-examinations (BSEs). At the same time, other studies find that raising mortality-related health concerns can subsequently increase proactive health intentions and behavior. Taken together, this raises the stakes for understanding when and how death-related cognitions are consequential for health decision-making.

Death on My Mind: "Not Me, Not Now"

As noted earlier, to understand how cognitions about mortality impact health decisions, it is necessary to distinguish between the motivational orientations elicited by conscious and nonconscious thoughts of death. When people are consciously contending with thoughts of death, health decisions are guided in large part by the proximal motivational goals of reducing perceptions of vulnerability to the salient health concern, thereby removing death-related thoughts from focal awareness. This can be accomplished with more or less

adaptive responses. That is, one can reduce vulnerability perceptions and thus conscious concerns about mortality through productive routes of prevention and detection behavior (e.g., increasing sunscreen protection; getting a screening exam). In this way, health promoting reactions help to minimize one's perceptions of, if not actual, vulnerability to the prospect of death.

In one of the first tests of this hypothesis, Arndt, Schimel, and Goldenberg (2003) reminded participants of death or another aversive control topic, and then had them immediately answer questions about their future fitness intentions (e.g., "How much do you think you will exercise over the next month?"). Participants who were reminded of death reported greater fitness intentions than those given the control topic. Notably, this effect was not moderated by the relevance of exercising to one's self-worth. The conceptual interpretation is that, like any good New Year's resolution, expressing stronger fitness intentions authorizes the individual to feel like they are starting on the path toward a healthier lifestyle, thus becoming less vulnerable to death in the process. In this way people are better able to push death off as an issue down the road instead of around the corner, and reassure themselves "*not me, not now*" (Chaplin, 2000).

The tendency for reminders of mortality to elicit health promoting intentions has been conceptually replicated in other domains and with varying populations. Conscious thoughts of death have resulted in greater interest in buying more protective sunscreen (Routledge et al., 2004), intentions of behavioral involvement regarding general health issues, performing BSEs among women shopping at a farmer's market (Arndt, Routledge, & Goldenberg, 2006), and stronger endorsement of a health promoting lifestyle among both young and old age adults (Bevan, Maxfield, & Bultmann, 2014; but see also Taubman-Ben-Ari & Findler, 2005). Additionally, the effect of conscious death thoughts is not limited to intentions, but translates into behavioral domains of health such as, under certain conditions, decreasing the smoking intensity of occasional smokers (Arndt et al., 2013) and increasing interest in receiving coupons for protective sunscreen products (Routledge et al., 2004).

However, the same goal of reducing perceived vulnerability and minimizing focal awareness of mortality may also be (more or less effectively) served by less adaptive responses that entail avoiding, or even outright denial of, vulnerability (e.g., convincing oneself the health threat is not something to take seriously). For example, Greenberg et al. (2000) found that immediately after being reminded of mortality (vs a control topic, or vs mortality reminders with a delay), participants reported a biased level of emotionality depending on what level of emotionality was ostensibly linked to an earlier demise. Such reactions are emblematic of a pervasive tendency for many people to avoid, deny, and suppress their vulnerability to health threats, especially when they are most vulnerable (van't Reit & Ruiter, 2013).

How then can one predict whether people will engage in adaptive or maladaptive strategies of reducing perceptions of vulnerability and focal concerns with death? Building from protection-motivation theory (Prentice-Dunn & Rogers, 1986) and other such perspectives (e.g., Witte & Allen, 2000), a key feature of the TMHM is that because one is contending with conscious thoughts of death, the appeal of a defense will vary as a function of the extent to which it allows one, at the same level of abstraction, to effectively deal with the threatening health context. For example, if one is optimistic about actually reducing the health concern or confident in the efficacy of the behavior in question and one's ability to perform the behavior, proactive strategies become viable responses. Lacking such confidence or optimism, people may eschew attention to the health concern and instead choose to engage in threat-avoidance strategies whereby one attempts to psychologically distance themselves from having to contend with the health threat.

In line with this reasoning, greater levels of health optimism and adaptive coping style both predict healthier intentions when research participants are consciously reminded of death. For example, Arndt et al. (2006) examined the association between individual levels of health optimism and intentions to conduct BSEs when participants were explicitly led to think about death (or not). When reminded of death, the higher one's level of health optimism, the greater the intentions of conducting BSEs. Similarly, after conscious reminders of death, higher levels of adaptive coping tendencies predicted more behavioral involvement in health care.

Cooper, Goldenberg, and Arndt (2010) provide converging evidence. In this study, higher levels of health optimism and higher levels of perceived efficacy of sun protection both predicted greater interest in sun protection intentions immediately after reminders of mortality. Two additional findings from this research are of note. First, these associations were stronger after mortality reminders than uncertainty reminders. Second, these relationships were observed with regard to a cancer-related risk (i.e., sun exposure), but not a disease with less fatal connotations (i.e., gum disease). Such findings suggest that the coping resources one brings to the table, with their implications for perceptions about effectively reducing threats to health, may influence the selection of proximal defenses that then presumably help to remove thoughts of death from consciousness. Looked at differently, the findings suggest that cognitions about death may function to engage, or bring more strongly online, the health cognition moderators so well documented in previous research.

Critically, these qualities are not just important at the dispositional level, but can be adjusted experimentally, providing tools through which interventions might utilize death-related cognition to foster healthier decisions. For example, Cooper et al. (2014) presented beach patrons with brief flyers about either cancer risks of sun exposure, appearance risks, or a neutral condition,

which were then combined with information that either accentuated or undermined the efficacy of sun protection behaviors. When thoughts of death from the cancer link were likely to be conscious, those given efficacy boosting information reported especially high protection intentions, while those given undermining information along with the cancer link had especially low intentions to protect themselves from the sun.

Taken together, research on proximal health-relevant defenses has helped to reveal that people have a greater repertoire of dealing with conscious thoughts of death than was previously recognized. Some of these strategies portend productive health consequences, whereas others appear to offer less potential benefits (a point we will return to when discussing future directions). Yet we can get a handle on how people deal with conscious thoughts of death by integrating insights from more traditional health models that focus on proximally relevant variables. Although we find such integration generative and encouraging, it is important to note that variables such as response efficacy and optimism have done a poor job of predicting health-relevant responses to death-related cognition that has faded from focal awareness. To the extent people routinely navigate through the world with the specter of mortality lurking in the background, such reactions to nonconscious thoughts of mortality become critical to understand.

Death on the Fringes of Consciousness: Does Self Trump Health?

The TMHM extends the core TMT hypothesis that nonconscious thoughts of death underlie efforts to bolster a sense of self-esteem and cultural meaning to understand health decisions. From this perspective, when contending with nonconscious thoughts of death an individual's concerns about health and vulnerability may no longer be the most operative motivation. Rather, as the threat of death is engaged more indirectly, health-relevant behaviors tend to be enacted, at least in part, based on their relevance to one's self-esteem and cultural meaning system. This too can result in healthy or unhealthy decisions, but depends less on the relevance to health, and more on the potential for the behavior to provide a perception of being a valuable member within a culturally meaningful reality.

To illustrate, recall the Routledge et al. (2004) study described earlier wherein participants who valued their appearance increased sun protection intentions immediately after mortality reminders, but decreased such intentions when there was an intervening delay after the mortality salience manipulation. Presumably this later response reflects an orientation to appearance and thus depicts how the operative motivation shifts as death-related cognition recedes from focal awareness. Subsequent studies extend this analysis to different domains; for example, mortality salience increased interest in cosmetic surgery among those who value their appearance, but not among those for whom appearance is not important or those who were satisfied with their

physical appearance (Tam, 2013). Indeed, perceiving oneself as falling short of cultural standards—such as those tied to appearance—might set the stage for behaviors, unhealthy or unnecessary though they may be, to close that cultural-value gap and manage subtle thoughts of death. This kind of reaction was similarly observed in Goldenberg, Arndt, Hart, and Brown (2005). In a group setting where social comparison was likely, women who saw themselves as discrepant from the Americanized "thin ideal" were more likely to restrict consumption of a nutritious but fattening snack when reminded of mortality.

Again, the driving force in the effects observed in these studies seems to be not so much a concern with the health implications of a behavior, but its connotations for enabling the individual to maintain a sense of cultural value. Perhaps the starkest demonstration of this prioritization is seen in work by Hansen et al. (2010). Smokers who derived self-esteem from smoking were actually less interested in quitting, and more likely to endorse continued smoking, when reminded of mortality. That this effect occurred from a mortality salience induction integrated into the health warning label on cigarette packaging makes such findings all the more important to consider from a health communication perspective.

Lest we imply nonconscious thoughts of mortality encourage only unhealthy behavior, it is important to clarify that the analysis also predicts health promoting behavior to the extent such behavior reflects values integrated into the person's esteem contingencies or cultural worldview. Recall for example the Arndt et al. (2003) study described earlier. Although deriving self-esteem from being physically fit did not moderate proximal exercise intentions after mortality salience, greater endorsement of fitness as a self-esteem contingency did predict greater exercise intentions when participants were distracted from previously aroused death-related thought.

Thus, the accumulating evidence meshes well with literature showing that self-esteem and self-presentational motives influence health decision-making (e.g., Leary et al., 1994; Mahler et al, 2003), but extends this work by demonstrating the role of mortality concerns in these processes. In so doing, it offers the potential to expand understanding of the existential landscape in a number of ways. First, it raises the prospect of using mortality reminders in conjunction with adjusting contingencies of value to encourage healthier decision-making. Second, it provides a conceptual umbrella under which one can understand how a broader range of cultural identifications and symbolic beliefs can influence health decision-making. We turn next to these areas of work.

Targeting malleable bases of cultural value. When mortality concerns are active but not conscious, efforts to change health behavior may benefit from targeting malleable bases of cultural value. Such a prediction offers applied potential, but also pushes us to consider the flexible nature of esteem oriented routes to managing existential insecurity and the potent influences on

that flexibility. Perhaps most notably, a variety of perspectives converge on the importance of social appeal and acceptance for self-esteem (e.g., Leary & Baumeister, 2000; Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004; Tesser, 1988), in part because others offer the consensual validation necessary to define valuable behavior (Becker, 1971; Cooley, 1902; James, 1890). It follows that people's health decisions should be more responsive to cues oriented toward social value when reminded of mortality. Consider the domain of smoking. When smokers viewed a public service video announcement concerning the social consequences of smoking (e.g., "who wants to date someone with bad breath"), participants reminded of mortality had higher quit intentions than those who observed the same video without mortality reminders (Arndt et al., 2009). This is especially the case for people who derive some sense of self-worth from smoking (Martin & Kamins, 2010; Wong, Nisbett, & Harvell, 2016). For example, smokers who derived some of their self-esteem from smoking reported stronger intentions to quit after being reminded of mortality along with the social ills that follow from this habit than when such reminders were paired with public service announcements emphasizing health risks (Wong et al., 2016).

Conveying positive social norms can also be useful in this regard, particularly as they are embodied by prototypical representations of people who engage in the behavior (Gerrard, Gibbons, Houlihan, Stock, & Pomery, 2008). In one study, patrons entering a grocery store to embark on their shopping were reminded of mortality or a control topic, and then visualized exemplars of healthy eaters (i.e., prototypes) or not. As determined from their receipts, those primed with mortality and healthy eaters purchased healthier foods than those just reminded of mortality or those just primed with healthy eaters (McCabe et al., 2015). The juxtaposition of mortality salience and prototypes was most likely to promote health behavior, perhaps in part, because such social prototypes can help to orient people to different bases of self-worth (Arndt et al., 2009).

Of course, cultural representations not only stem from typical people who encapsulate what is seen as culturally normative and affirming, but can also be driven by iconic celebrities who hold the capacity to steer what is valued in ways that can impact health-relevant behavior (e.g., Dalton et al., 2003). McCabe, Vail, Arndt, and Goldenberg (2014) extended this work to examine the interactive effect between mortality reminders and medical doctor versus celebrity endorsement on different health-related attitudes and intentions. Whereas the persuasive effects of product endorsement by medical doctors were more potent after conscious death reminders, when dealing with nonconscious thoughts of death, celebrity endorsement was more effective at influencing greater water consumption behavior, less willingness to engage in risky alcohol intake, greater antismoking attitudes, and more influenza vaccination intentions.

The utility of targeting how individuals derive a sense of value in conjunction with mortality reminders also shows particular promise for safe sun behavior. This is perhaps not surprising given the centrality of appearance motives to tanning behavior (e.g., Cafri et al., 2008). The guiding idea is if people can be steered away from thinking of tan skin as attractive, subtle primes of mortality might lead to more interest in sun protection. This was first suggested in Routledge et al.'s (2004) work on tanning. When participants were shown an advertisement that associated tanning with an attractive appearance (a tanned attractive woman vs a beach ball), mortality reminders lead participants to express greater interest in tanning products. However, in subsequent research, whereas information that "bronze is beautiful" increased tanning intentions after mortality reminders, beachgoers reminded of mortality and given information conveying that "pale can be pretty" requested higher levels of protective sunscreen as compensation for participating in the study (Cox et al., 2009). Furthermore, framing a UV photograph of participants' faces as revealing damaging effects on appearance, rather than health, interacted with mortality reminders to lead participants to take more sunscreen samples and report greater intentions to use it (Morris, Cooper, Goldenberg, Arndt, & Gibbons, 2014).

Thus, there seems to be potential for nonconscious thoughts of mortality to engage healthier behavioral practices if the interface of those practices with social value is targeted. At the same time, we don't mean to imply all people are susceptible to these types of framing effects. One factor that may inform people's susceptibility to socially prescribed standards and the malleability thereof is the extent to which individuals base self-esteem on contingencies extrinsic to their core sense of self (Schimel, Arndt, Pyszczynski, & Greenberg, 2001). Research shows that, after mortality reminders, people who are higher in extrinsic self-esteem are especially susceptible to framings of health-relevant behavior in socially valuable ways (Arndt et al., 2009; Tam, 2013).

Beyond esteem: Integrating other cultural identifications and beliefs. There are of course other ways in which people's cultural belief systems interact with existential insecurity to impact health decisions, and one of the generative aspects of the TMHM is to provide a platform from which to integrate these seemingly disparate influences. Consider, for example, when and how religious belief systems color the health decisions people make. In this vein, we're reminded of Bob Marley's apparent decision not to amputate his toe due to his Rastafarian beliefs; a decision that ultimately had fatal, and for reggae fans regrettable, consequences. Vess, Arndt, Cox, Routledge, and Goldenberg (2009) inform such issues. When distracted from thoughts of death, high religious fundamentalists (e.g., Altemeyer & Hunsberger, 1992) were more inclined to support religiously motivated decisions to refuse medical treatment and endorse prayer as a medical substitute. This suggests an ironic tendency for underlying concerns about death to, at times, sway

individuals to uphold their worldviews at the expense of what secular wisdom would say protects their health.

Broader consideration of peoples' beliefs that imbue existence with a sense of symbolic meaning, and different realities that threaten a sense of symbolic meaning, yields additional insights. Many cultural beliefs advance a conception of humans as transcending a mere animal-like finite existence (Goldenberg, Pyszczynski, Greenberg, & Solomon, 2000; Becker, 1971; see Chapter 9, this volume). We see ourselves as more important, valuable, meaningful, and therefore more enduring than the stray cat or milked cow. This system of meaning comes under attack, however, when reminded of just how animal-like we are. As such, and especially when reminded of their mortality, people are motivated to distance themselves from the physicality, or creatureliness, of the body (Chapter 9, this volume).

Health scenarios are often the mirror upon which this reality is reflected back to us. At the doctor's office you may be poked, prodded, squeezed, or otherwise made aware of the "meat and bones" of your body; a body which, like that of other animals, is doomed to death and decay. If this weren't enough, this sense of "creatureliness" can also strip the specialness away from our existence and threaten the very meaning system that we use to manage underlying existential fears. These ideas lead to the hypothesis that awareness of mortality can foster avoidance of, if not distain for, health-related bodily processes. For example, participants who were reminded of mortality, relative to those in control conditions, later reported more negative reactions to breast-feeding and physically avoided what they thought were breast-feeding mothers (Cox, Goldenberg, Arndt, & Pyszczynski, 2007).

Indeed, the female breast may be an especially prominent reminder of both creatureliness and mortality issues (Morris, Goldenberg, & Heflick, 2014). Not only is there the material function of being a milk dispenser, but it is also the repository of the most common cancer among women (US Cancer Statistics Working Group, 2016). Accordingly, performing breast exams on a model increases the accessibility of death thoughts, and when pairing reminders of death with exposure to an essay that highlighted human creatureliness, females show reduced intentions to perform BSEs and shorter lengths of time spent conducting BSEs (Goldenberg et al., 2008). This reaction to breast exams extends to the doctor's office as well. Women in an oncological waiting room who were high in neuroticism (which predisposes sensitivity to body issues) expressed more perceived discomfort from mammograms after reminders of creatureliness, and when women in the psychology research lab were reminded of their mortality and creatureliness, they reported less willingness to undergo mammography than women not given these reminders (Goldenberg, Routledge, & Arndt, 2009). This research helps to reveal an important forum in which creatureliness concerns can impact the lives we lead, and further highlights a potential obstacle in the way of health decision-making.

One conceivable solution to this obstacle may be to encourage a certain amount of detachment from the physical body. Ironically, objectification is worth considering in this regard. Although there are myriad negative consequences that stem from objectification (Fredrickson & Roberts, 1997), somewhat counterintuitively, objectifying images of the female body could offer an avenue for distancing from the implications of the body's physicality for one's sense of symbolic meaning. Indeed, women high in trait self-objectification responded to an objectified depiction of a woman's body with increased breast exam intentions after being reminded of mortality (Morris, Cooper, Goldenberg, Arndt, & Routledge, 2013). This work was not intended to condone objectification, but to highlight the motive and defense inherent in construing the body symbolically.

Reciprocal Contributions of Studying Death and Health: A Look Back and to the Future

There are growing programs of research at the interface between social psychology and health that are positioned to offer both translational and theoretical insights (Rothman, Klein, & Cameron, 2013), thus embracing both edges of the quote from Lewin about theories and practicalities. The TMHM was proposed in this spirit. For example, research derived from the TMHM affords greater understanding of when health cognitions and esteem/identity factors are likely to be more or less influential in health decisions. As we discuss a bit more below, this in turn has implications for efforts to change health behavior. More broadly, research to date suggests a broader motivational network in which health decisions occur and the relevance of a wider range of factors than perhaps would otherwise be recognized. Although particular health decisions are certainly influenced by unique factors, and the TMHM needs to be supplemented with more focused perspectives, observing the operation of existential processes in such a variety of health decisions—from choices to imbibe excessively, exercise, tan, smoke, or get a screening exam—illustrates how broad theoretical frameworks offer both integrative and generative possibilities for understanding health (Klein et al., 2014).

At the same time, the study of health has opened doors to better understanding the complex ways people manage existential insecurity. For example, this work has revealed a wider repertoire of responses to conscious thoughts of death than had been initially considered; the influence of individual differences in shaping what types of proximal defense an individual may enlist, and with perhaps more clarity, the divergent motivational implications of conscious and nonconscious death-related thought. Further, health-focused research has illuminated the socially infused flexibility of esteem-based defenses to deal with awareness of mortality.

Notwithstanding such contributions, when one gets deeper into how people manage the routine awareness of mortality in their day-to-day affairs, further complexities needing attention are revealed. We will briefly consider a few such areas, starting with the nature of proximal defenses. Very little work has examined the relative effectiveness of different strategies for dealing with conscious thoughts of death. Integrative efforts with health research may provide insights. van't Riet and Ruiter (2013) note four distinct defensive reactions to health information: avoidance, denial, cognitive reappraisal, and suppression, and highlight the potential for differences in emotional consequences and long-term adaptive function. To the extent such reactions might be utilized as proximal defenses against health-relevant concerns about mortality, such differentiation, when and why one is preferred over others, and the downstream consequences of choices may enrich understanding of health-relevant responses to conscious thoughts of death as well as the nature of terror management.

Such attention may also help inform the emotional dynamics of mortality awareness as well as the strategic use of death-related information in persuasive fear messages. As it stands, there are differing views about the potential of the TMHM to inform research on such persuasive campaigns. Whereas Hunt and Shehryar (2011; see also, for example, Jessop & Wade, 2008) review research illustrating the potential of terror management processes to both facilitate and undermine persuasive efforts according to many of the factors discussed here, Tannenbaum et al. (2015) find no such effects in their recent meta-analysis of fear messaging. Of course, as this chapter details, but not considered by Tannebaum et al., it is important to recognize that appeals need not explicitly mention death to conjure up death-related cognition; implicating serious health consequences in a communication can do so as well. Further, whether people are actively thinking about death is important for evaluating whether the appeal encourages "health" or "esteem" based responses. This necessitates more careful attention than a gross distinction, as was done in Tannebaum et al., between whether a health response is measured the same day as delivery of the communication. Fine-grained measurement of this issue may be necessary, and is likely challenging in the context of much health communication research. But carefully considering the source of fear and the role of consciousness may help to inform when and why such appeals are effective, when they fall flat, and when they backfire (Ruiter, Kessels, Peters, & Kok, 2014).

More careful attention to emotional processes may additionally help to inform the role of terror management in risky drug and alcohol use (see McCabe & Arndt, 2016). Perhaps because of the potential for anxiety involved (see Juhl & Routledge, 2016), death reminders can motivate people to—borrowing from a reviewer on one paper who, in turn, borrowed from Pink Floyd—become "comfortably numb" by increasing interest in intoxicants like marijuana (Nagar & Rabinovitz, 2015) and alcohol purchasing

behavior (Ein-Dor et al., 2014). Such risky behavior may be most likely for those who lack secure terror management buffers. Indeed, night club patrons with low self-esteem drank more alcohol (as indicated by breathalyzer analysis) when primed with mortality reminders (Wisman, Heflick, & Goldenberg, 2015).

Another complexity that is revealed by considering an everyday context like health is the potential for blurred lines between proximal and distal defenses, perhaps especially as people age or when facing terminal illness. Indeed, research has already begun to show that, under certain conditions, older adults exhibit defenses that are not found among younger populations like increasing generative concern after reminders of mortality (Maxfield et al., 2014) and that in a health context, older adults are more willing than their younger counterparts to indicate greater health intentions in general (Bevan et al., 2014; see also Chapter 18, this volume). Further, those facing serious or terminal illness must contend with how death-related cognition can potentially undermine well-being (Cox, Reid-Arndt, Arndt, & Moser, 2012), especially when such thoughts occur soon after the initial diagnosis (Luszczynska et al., 2012), and patients face an erosion of their security providing beliefs (e.g., religion; Edmondson, Park, Chaudoir, & Wortmann, 2008). Clearly, there are uncharted waters here to explore in the context of palliative care.

Finally, there is a need to examine sustainable influences on health. Like most TMT research, TMHM studies have typically been conducted in a one-shot experimental setting, while the health decisions that people contend with may be contemplated for days, weeks, or years. This raises questions about how terror management processes unfold over time more generally, and whether awareness of mortality has an enduring influence on health decisions in particular. Recent research has begun to tackle this critical issue. In Morris, Goldenberg, Arndt, and McCabe (2018), when participants were primed with mortality and rode an exercise bike they later reported exercising more in the 2 weeks that followed than participants not reminded of mortality, which additionally led them to report basing their self-esteem more on fitness. In a second study, smokers who visualized a prototypical unhealthy smoker after being reminded of mortality reported more attempts to quit smoking in the following 3 weeks, became more committed to an identity as a nonsmoker, and this in turn inspired continued quit attempts over the next 3 weeks. These studies lay the groundwork for a longitudinal model in which death-related thought encourages identity-relevant behavior, the behavior fosters more identity-relevance, and this in turn promotes more of the (healthy) behavior. Although there is still much to be done to get a solid model of the enduring potential of terror management processes, this provides yet another illustration of the reciprocal contributions of an interface between terror management and health.

CONCLUSION

TMT began as an attempt to understand the importance of self-esteem and underlying reasons for seemingly perpetual conflict between differing cultures. It has since budded into a powerful explanatory tool that can illuminate diverse psychological processes occurring in everyday life. One facet of this growth has been the application of TMT to the world of health. The resulting TMHM provides a framework for determining the type of motivation for defending against death awareness, the subsequent reactions that are likely to emerge from these motivations, and the eventual health outcomes that are more or less likely to occur. Importantly, this research has not only expanded the reach of a theory into the rich dynamics of everyday life, but in so doing, generated what we hope is progress toward understanding the basic underlying process through which people contend, ideally in healthier ways, with the reality of a lifespan that is unforgettably finite.

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Chapter 17

Aging and Coping With Mortality: Understanding Attitudes About Aging and Age-Related Differences in Coping With Death

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The mostly subtle, though sometimes brutal, signs of aging are inevitable. Incremental changes in eyesight, hearing, physical stamina, and cognitive functioning may not be noticed as they occur, yet the accumulation of these age-related processes can result in significant changes in daily life and functioning. Additionally, more dramatic and significant changes can occur: having a major medical event, surrendering one's car keys, or moving to a senior living facility, to name a few. Even people fortunate enough to enjoy a physically and psychologically healthy aging process may encounter reminders of their age that make them wonder where the time has gone. External cues, such as the first time a visibly younger person gives up his or her seat for you—the "older" person in need of some rest—may highlight not only that you are aging, but that other people are noticing. All of these age-related changes, big and small, signal approaching mortality. In light of terror management theory's (TMT) central premise that the instinctual desire to distance one's self from mortality is a primary motivator of behavior, older adults are likely to experience the problem of impending death very differently than their younger counterparts. The aging process itself may serve as a continual mortality prime, thereby impacting how young adults perceive older adults, how older adults perceive themselves, and the ways in which older adults cope with the problem of mortality.

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This chapter approaches existential issues related to aging from two primary perspectives: (1) the consideration of young and older adults' attitudes about aging and older individuals and (2) the examination of age-related differences in death anxiety and responses to reminders of mortality. The former perspective offers an understanding of the existential underpinnings of ageism and its deleterious effects, and the latter perspective reviews research concerning age differences in self-reported death anxiety and terror management processes. Using TMT and relevant theories from the psychology of aging literature, we consider the existential challenges that aging presents and explore potential clinical applications, which may promote healthy adaptation to aging and older age via awareness and acknowledgment of life's brevity.

TERROR MANAGEMENT THEORY

As noted elsewhere in this volume, TMT (Greenberg, Pyszczynski, & Solomon, 1986) explains how humans' awareness of their mortal nature influences various behaviors aimed at distancing one's self from death and maintaining the cultural anxiety buffer, which includes faith in the cultural worldview and self-esteem. For the purposes of this chapter, we simply remind the readers of some of the basic concepts of the theory, beginning with the primary modes of defense: proximal and distal (see Chapter 2, this volume). Proximal defenses against death concerns are logically and clearly related to denying (e.g., suppression of death-related thoughts) or distancing from death (e.g., increase in healthy intentions). Distal defenses are not obviously related to management of death-related anxiety and are focused on the defense and maintenance of the anxiety-buffering system (e.g., validation of the worldview by promoting in-group and distancing from out-group). Though there are multiple hypotheses associated with TMT (see Chapter 1, this volume), the most frequently investigated is the mortality salience hypothesis, which is the focus of this chapter; the hypothesis suggests that to the extent the cultural worldview and self-esteem provide protection from death-related anxiety, reminders of mortality will intensify the need for protection and validation of that anxiety-buffering system.

We also remind readers that the majority of TMT research has included young adult participants, typically college-aged students (see Pyszczynski, Solomon, & Greenberg, 2015, for a review) with notable exceptions including studies with 7- and 11-year-old children (Florian & Mikulincer, 1998), municipal court judges believed to primarily be in middle-age (Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989), and an adult life span sample (Pyszczynski et al., 1996). However, in the last 10 years, terror management research has begun to examine age-related differences in responses to mortality reminders.

TERROR MANAGEMENT PERSPECTIVE ON OLDER ADULTS AND THE AGING PROCESS

As evidenced by the research reviewed in this volume, it is clear that mortality salience has the potential to significantly impact diverse behaviors, specifically related to the maintenance of the anxiety-buffering system, including the cultural worldview, self-esteem, and relationships. It is also well established that undermining those aspects of the anxiety-buffering system can increase death awareness (see Chapter 1, this volume) and contribute to a variety of psychological problems (see Chapter 19, this volume). Particularly within the context of the cultural importance of youthful appearance and stamina, it is conceivable that physical aspects of aging signal death's increasing proximity and decreasing ability to meet some or all of the culture's standards. Aging may therefore serve as a mortality prime, and recognizing aging as a mortality reminder may advance understanding of ageism and its existential roots.

People are generally resistant to identify as older adults, particularly at an implicit level (e.g., Hummert, Garstka, O'Brien, Greenwald, & Mellott, 2002), and after the age of 40, people typically report feeling as though they are about 20% younger than their chronological age (Rubin & Berntsen, 2006). Based on TMT's basic premise that humans are motivated to distance from death, it may be that older adults' temporal proximity to death motivates distancing from older adults themselves. In support of this notion, stimuli related to older adults (even relatively healthy ones) have effects similar to traditional mortality salience inductions (see Chapter 4, this volume). For example, viewing pictures of both young and older individuals resulted in greater cognitive accessibility of death-thoughts among young adult participants compared to participants shown pictures of only other young adults, suggesting that older adults prime mortality (Martens, Greenberg, Schimel, & Landau, 2004; Study 1). Additionally, after mortality reminders, young adults reported greater differences between themselves and older individuals, whereas comparisons between themselves and other young individuals were unaffected by mortality salience (Martens et al., 2004; Study 3). This effect was moderated by young adults' ratings of similarity to older adults; interestingly, young people who previously indicated greater similarity with older individuals reacted to mortality salience with greater distancing from older adults. Young adults who did not indicate similarities with older adults did not respond to mortality salience with distancing from this age-group. The authors suggest that this seemingly counterintuitive finding is a function of the unusual nature of ageism: young individuals holding negative attitudes are themselves aging individuals who will ultimately become older adults (if they are lucky) and targets of ageism. Aversion to older adults may relate to one's own concerns about aging and mortality, and in fact, young adults' death anxiety and ageism are positively associated

(Bodner & Cohen-Fridel, 2014). Martens, Goldenberg, and Greenberg (2005) suggest that older adults "represent our future in which death is certain, physical deterioration is probable, and the loss of current self-worth-enhancing characteristics a distinct possibility" (p. 223); thus from a TMT perspective, ageist attitudes toward older adults relate to the desire to distance one's self from the aging process that leads to life's end.

Aside from age in years, there are specific aspects of aging that may be even more threatening based on their threats to the integrity of the body and mind; e.g., significant physical health problems or dementia represent particularly threatening aspects of aging. Even among individuals working at nursing homes, perceptions of older adults are influenced by their health and cognitive status. In comparing perceptions of healthy older adults, physically ill older adults, and cognitively impaired older adults, ratings were increasingly negative across the three groups, respectively (Kahana et al., 1996). Such negative evaluations of poor physical and cognitive health among older adults are particularly problematic for a group that is often the target of stereotypes about poor physical and cognitive health. Of course, like other targets of stereotypes, stereotypic beliefs about older adults are mixed (Hummert, Garstka, Shaner, & Strahm, 1994). Some positive stereotypes include the sage or wise elder, but negative stereotypes develop early (for a review, see Gilbert & Ricketts, 2008), which perhaps contributes to their prevalence and power. A meta-analysis of studies on ageism reveals that older adults are rated more negatively than young adults across numerous dimensions (attractiveness, competence, positive qualities, interest in interacting with, and overall stereotypical behaviors; Kite, Stockdale, Whitley, & Johnson, 2005).

From the perspective of the stereotype content model (SCM; Fiske, Cuddy, Glick, & Xu, 2002; see also Fiske, Cuddy, & Glick, 2007), stereotypes comprise two dimensions (warmth and competence), and a group's levels of warmth and competence determine the level and type of discrimination or prejudice likely to be experienced by the group. Older adults are typically viewed as high warmth and low competence; therefore, they are not viewed as competitive for resources and are generally regarded with pity and sometimes admiration (Cuddy, Norton, & Fiske, 2005). Using the SCM conceptualization of ageism, O'Connor and McFadden (2012) investigated young adults' perceptions of young (29-year-old) or older (71-year-old) adult targets with varying levels of health (normal health, unknown health, arthritis, or dementia). Young adults rated older targets as warmer and less competent than young targets, and regardless of target age, those with dementia diagnoses were rated as warmer and less competent than targets with any other health status. In support of the idea that these effects were partially driven by older adults' ability to prime mortality, young participants displayed greater death-thought accessibility when exposed to older adult targets than young adult targets. Interestingly, participants exposed to targets

(both young and old) diagnosed with dementia produced more death-related words compared to participants in the other health conditions, but this effect was moderated by target age; older targets diagnosed with dementia elicited greater death-thought accessibility than young targets diagnosed with dementia (note, a fictional type of dementia, with symptoms similar to Alzheimer's disease, was described for the young adult target diagnosed with dementia and was described as more likely to occur among younger individuals to avoid the unlikely diagnosis of Alzheimer's disease for a 29-year-old). This study not only highlights the role of existential anxiety in ageist attitudes, but also suggests that dementia, a disease characterized by gradual erosion of selfhood (or death of self), appears to elicit elevated thoughts of death.

Taken together, these studies suggest that for young adults, older individuals can increase death-thought accessibility (Martens et al., 2004; O'Connor & McFadden, 2012) and trigger signs of distancing from and less liking of older adults (Martens et al., 2004). One can imagine how these findings relate to pervasive ageism in Western culture. Aside from the generally ageist evaluations of older adults as having lower competence and status (Cuddy et al., 2005; North & Fiske, 2012), it appears that many young adults are motivated to distance themselves from older adults, an ageist response made more likely when aware of mortality (Martens et al., 2004). In everyday circumstances, it is easy to see the potential impact of both attitudinal and behavioral ageism on older adults' self-perceptions and psychological well-being, as well as the treatment and services provided to older adults (e.g., health care and legal approaches to medical and financial end-of-life planning and preparation); further, the reviewed research indicates that the intensity and impact of ageism may be increased by mortality reminders.

Though TMT research on ageism has not included older adults themselves, it has been established that older adults often hold negative views of aging and older individuals—perhaps because of prevalent negative stereotypes and views of later life. For example, older adults' perceptions of older people are more complex than both young and middle-aged adults' perceptions, which stems not only from the presence of additional positive, but also from the presence of additional negative perceptions associated with older adulthood (Hummert et al., 1994). Ageist beliefs developed early in life may be carried into later years, when they become self-relevant. This internalization of negative beliefs has been termed stereotype embodiment and associated with a variety of negative outcomes for physical and psychological health (Levy, 2009). For example, negative attitudes about aging are associated with negative expectations about physical and psychological health (Kim, 2009), as well as lower level engagement in healthy activities (e.g., Sarkisian, Prohaska, Wong, Hirsch, & Mangione, 2005). In experimental work, exposure to negative age-related stereotypes resulted in greater self-reported loneliness and poorer self-perceived health compared to positive age-related stereotypes (Coudin & Alexopoulos, 2010). Taken together, it is

clear that negative beliefs about aging negatively impact young adults' perceptions of older adults, as well as older adults' own attitudes about aging and their physical and psychological health.

Views about aging and older adults are also associated with self-reported death anxiety. DePaola, Griffin, Young, and Neimeyer (2003) reported positive associations between older adults' anxiety about their own aging and negative views of older adults, both of which were also correlated with greater death anxiety. In an adult sample (29–100 years old, $M = 57.84$), aging anxiety and death anxiety were positively associated yet distinct constructs, and both were associated with greater psychological distress (Bodner, Shrira, Bergman, & Cohen-Fridel, 2015). Among older adults, aging anxiety and death anxiety both significantly predicted ageism, and a significant interaction suggested that with low death anxiety, aging anxiety and ageism were positively related, but this relationship did not exist when death anxiety was high; similarly, with low aging anxiety, death anxiety and ageism were positively related, but this relationship did not exist when aging anxiety was high (Bodner, Shrira, Bergman, Cohen-Fridel, & Grossman, 2015). In other words, though both aging anxiety and death anxiety predict ageist attitudes, there is typically one dominant type of anxiety that contributes to ageism. This series of findings highlights the overlap between concerns about aging, ageism, and death-related anxiety, and suggests that understanding factors contributing to older adults' anxiety will not only assist in reducing the psychological distress potentially associated with aging and/or mortality, but may have the added benefit of reducing ageist attitudes and behavior.

CONTEMPLATING OLDER ADULTS' APPROACH TO MORTALITY

Based on existing evidence that viewing photographs and reading profiles about older adults have similar effects as a mortality reminder for young adults (e.g., Martens et al., 2004; O'Connor & McFadden, 2012), older adults may be living reminders of the inevitability of death. If exposure to external reminders of aging and mortality increases young adults' death-thought accessibility and defensive reactions, older adults' personal experiences of the many changes associated with aging (e.g., declines in vision, hearing, mobility, stamina, etc.) could be continual reminders of mortality with the potential to create significant existential anxiety and psychological challenges. Additionally, changes to the anxiety-buffering system are also likely in later life. First, the mainstream cultural worldviews may no longer comport with those of the typical older adult. To provide just a few examples, some cultural values emphasize youthful beauty and physical strength and stamina, as well as occupational successes, particularly in Western cultures. Most of these values become less and less attainable in later life. Additionally, in extreme situations, older adults may lose the ability to

maintain the much-valued independence that is characteristic of US culture—perhaps through the loss of driving privileges, inability to handle one's finances, or moving out of one's home. With decreasing recognition and validation from the surrounding culture, older adults may question the validity of the cultural worldview and subsequently have fewer opportunities to receive self-esteem boosts. To the extent that the anxiety-buffering system is essential in defending against the potential for death-related anxiety, changes to this buffer would appear to put older adults at a distinct disadvantage in managing existential terror. On the other hand, recent findings suggest that with increasing age, self-esteem is less contingent, more stable, and generally higher compared to younger individuals (Meier, Orth, Denissen, & Kühnel, 2011), perhaps indicating that older adults do not need external validation to fend off existential anxiety.

In considering the ability of older adults to effectively manage existential anxiety, one may be best served by an inventory of the group's general functioning. Of course, like any other age-group, older adults are diverse in their experiences and functioning, but there are some general trends in the physical, cognitive, and social functioning of older adults that help illustrate general patterns in later life (see Grenade & Boldy, 2008; Harada, Natelson Love, & Triebel, 2013; Mendonca, Pezarat-Correia, Vaz, Silva, & Heffernan, 2016 for overviews of social, cognitive, and physical literatures, respectively). Although full coverage of these areas of research (and their overlap) is beyond the scope of this chapter, a brief overview of primary areas of change will highlight the areas of growth and loss in older adulthood.

Physical changes. Aside from very common declines in visual and hearing acuity (Fozard & Gordon-Salant, 2001), older adults also exhibit declines in physical endurance, muscular strength, and respiratory functioning. These changes have the potential to influence the ability to do a variety of everyday tasks, including household chores, yard work, shopping, and driving, to name just a few (Miller, Rejeski, Reboussin, Ten Have, & Ettinger, 2000). Changes in vision, flexibility, and balance also result in increased fall risks, and older adults are at greater risk for significant injury following falls (Ambrose, Paul, & Hausdorff, 2013). Physical changes thus have the potential to significantly impact older adults' daily lives.

In the face of these changes, many older adults employ a variety of strategies and adaptations which match their level of physical functioning and goal attainment, and these compensation strategies are associated with well-being (Haynes, Heckhausen, Chipperfield, Perry, & Newall, 2009). More specifically, older individuals who used more active strategies (e.g., help-seeking, persistence, and task modification) or a combination of active and compensatory strategies (e.g., social comparison, positive re-appraisal, re-engagement, downgrading expectations, and downgrading task importance) for maintaining control reported greater physical and psychological health compared to older individuals who used only compensatory strategies or no

strategies at all. In studies examining adjustment to disability or mobility changes from arthritis, older adults reported adaptation to and compensation for losses to optimize physical functioning; these strategies were associated with better psychological status as well (e.g., Gignac, Cott, & Badley, 2000, 2002; Janke, Son, & Payne, 2009). Despite age-related physical declines, which may act as internal mortality reminders, many older adults appear to have ways of adapting that protect them from psychological distress.

Cognitive changes. Inevitable declines in cognitive functioning also occur for older adults. Although people are most familiar with the idea of increasing problems with memory, age is also associated with decreased processing speed, attentional capacity, and executive functioning, as well as increased word-finding difficulties (Craik & Salthouse, 2008). Generally, cognitive changes are part of the aging process, and some decline is considered "normal aging." Within normal age-related cognitive changes, daily functioning is not typically impaired, but people are usually aware of the changes. Beyond this level, various forms of pathological cognitive aging also occur; dementias (e.g., Alzheimer's disease, vascular dementia, Lewy body dementia, frontotemporal dementia, among others) involve cognitive impairment that does interfere with daily functioning and the ability to live independently (Alzheimer's Association, 2016).

Dementia is widely perceived as a devastating diagnosis that is outside of one's control, which creates the potential for dementia worry, even among the cognitively healthy (Kessler, Bowen, Baer, Fr lich, & Wahl, 2012). It is understandable why the prospect of dementia could be threatening, particularly to older adults who are the most vulnerable population; not only are dementia diagnoses incredibly common (Alzheimer's Association, 2016), but there are many real-world consequences of significant cognitive decline. For example, Overdorp, Kessels, Claassen, and Oosterman (2016) found that neuropsychological deficits, particularly in the areas of memory and executive functioning, are associated with greater difficulty performing instrumental activities of daily living (IADLs: food preparation, financial administration, housekeeping, use of telephone, responsibility for own medication, mode of transportation, and shopping). Decline in IADLs obviously limit one's ability to maintain independence, potentially raising concerns about becoming a burden to family or requiring paid assistance. Highlighting the bidirectional relationship of older adults' cognitive status with emotional and social functioning, people diagnosed with dementia also frequently experience depression and anxiety (Alzheimer's Association, 2016), and there is some indication that maintaining social networks in later life serves a protective function against dementia-related diagnoses (Fratiglioni, Wang, Ericsson, Maytan, & Winblad, 2000).

Social changes. Social changes may occur as a result of the aforementioned physical and cognitive changes. With decreased physical and cognitive functioning, it may be more difficult to socialize in ways that were

previously accessible. Older adults are vulnerable to decline in social networks and support due to a variety of life changes, including some of the physical and cognitive changes previously mentioned, such as declining health, sensory loss, and mobility restrictions, in addition to social changes like retirement, deaths of friends and family, and changes in living situation (Cohen-Mansfield & Parpura-Gill, 2007). Decreased socialization and loneliness negatively impact psychological status, contributing to negative quality of life, poor physical and health outcomes, impaired cognition, and psychological distress, such as depressive symptomology (Berkman, Glass, Brissette, & Seeman, 2000; Cornwell, 2009; Heikkinen, Berg, & Avland, 1995). A meta-analysis revealed that maintaining strong social relationships was associated with a 50% reduction in mortality risk (Holt-Lunstad, Smith, & Layton, 2010). Given the protective nature of social relationships, in general and within the context of terror management (see Chapter 10, this volume), it may be initially concerning that older adults report decreased interaction with acquaintances; however, this is accompanied by stable contact with close members of the social network (i.e., family, longtime friends; Carstensen, 1991). In another indicator of the propensity for adaptation of later life, though older adults report having smaller social networks and less social contact than young and middle-aged adults, they indicate the greatest satisfaction with the size of their social networks (Lansford, Sherman, & Antonucci, 1998).

Aging and adaptability. Despite the changes in physical, cognitive, and social realms, many indications of compensation, adjustment, and resilience in later life are noted. The majority of older adults report strong and stable emotional health well into their 70s and 80s (Scheibe & Carstensen, 2010), until very old age when decreases in positive emotion, increases in negative emotion (Charles, Reynolds, & Gatz, 2001), and decreases in life satisfaction (Mroczek & Spiro, 2005) are observed. Additionally, older adults' self-esteem is generally higher, more stable, and less contingent (Meier et al., 2011); their relationships generally involve less defensiveness and greater coping with interpersonal conflict (Diehl, Coyle, & Labouvie-Vief, 1996). This presents what is sometimes called the paradox of aging: when faced with decline, loss, and approaching mortality, how are older adults managing so well?

Several prominent theories of healthy aging suggest that greater life experience may provide multiple benefits to older adults faced with new challenges in later life. According to the selection, optimization, and compensation (SOC) model (Baltes & Baltes, 1990), continual adaptation to one's current level of functioning is necessary for healthy aging processes. In this process, one selects the activities to be relinquished and pursued, optimizes performance by investing extra effort to maximize one's potential in the selected areas, and, when necessary, offsets waning abilities with compensatory strategies. Together, these strategies assist in preserving

functioning and well-being as age-related decline occurs. In a similar vein, Heckhausen and Schulz's life span theory of control (1995) suggests that healthy aging is characterized by decreasing emphasis on primary control (exerting one's control on the external environment to meet one's needs) and increasing use of secondary control (adjusting one's internal state to match the external environment). The pairing of these adjustments becomes increasingly important in maintaining a sense of control and involvement when aging processes begin to slowly corrode one's sense of independence. Both the SOC model and the life span theory of control suggest that older adults are quite capable of adapting to age-related changes to enhance their abilities and well-being.

Socioemotional selectivity theory (SST; Carstensen, Isaacowitz, & Charles, 1999) suggests that older age is accompanied by the increasing sense of one's time limitations. These time limitations create the impetus to reprioritize one's goals; as a result, older adults become increasingly focused on emotional goals. The focus on meeting emotional goals may involve the pruning of one's social network to include relationships and interactions that are more likely to result in positive emotional experiences (rather than uncertain or negative outcomes; Carstensen, 1991), attending to more positively valenced information (Isaacowitz, Toner, Green, & Wilson, 2008), which likely contributes to more positively valenced memory compared to young adults (Charles, Mather, & Carstensen, 2003). Age-related attention to positive experience has come to be known as the positivity effect (for a review of related literature, see Carstensen & Mikels, 2005) and is particularly strong among older adults with greater cognitive resources (e.g., Mather & Knight, 2005). From the perspective of SST, the sense of less time remaining in life would motivate older adults to rely on positive relational investments as a more effective emotion regulation strategy.

Of course, there are real and significant challenges associated with aging that cannot be ignored and not all challenges will be fixable via compensation and emotion regulation. Dynamic integration theory suggests that older adults' lifetime of experience will help manage familiar and simple problems, but decreasing cognitive capacity will make the management of complex problems involving high levels of emotional arousal increasingly difficult to cope with (Labouvie-Vief, 2009). The strength and vulnerability integration (SAVI) model (Charles & Luong, 2013) similarly suggests that, when high levels of emotional arousal are present and demand is high, older adults will have increasing difficulty effectively managing difficult situations, particularly when highly arousing emotions are sustained. From the perspectives of dynamic integration theory and SAVI model, older adults have gained many strengths from their experiences, yet also experience substantial age-related declines that will make complex emotion regulation more challenging.

Age-related declines in physical, cognitive, and social areas are inevitable, yet multiple theories help explain how older adults avoid an exclusively downhill emotional and functional decline. Adaptation to current circumstances and emotion regulation skills among older adults may promote more effective strategies that allow greater positive experiences among healthy older adults, even though they have less temporal distance from death. It may be that life experiences and emotional well-being help reinforce the anxiety-buffering system to cope with mortality. However, alternative theories raise the possibility that the complexity and arousing nature of thinking about and coping with mortality will make management of death-related anxiety more demanding and perhaps outside their capacity.

SELF-REPORTED DEATH ANXIETY ACROSS LIFE SPAN

Although terror management research is largely associated with responses to increased awareness of mortality via experimental inductions, related research addresses self-reported fear of death or death-related attitudes. Of course, because one primary approach to coping with awareness of mortality is to deny death or seek distraction, explicit measures of death-related anxiety are not generally predictive of responses to mortality salience (e.g., Greenberg et al., 1995). Nevertheless, it may be informative to consider self-reported death anxiety in developing a better understanding of age-related differences in managing death-related concerns. There appears to be a curvilinear relationship between age and death anxiety, with lower levels reported in young and old age and the highest levels found in middle-aged adults (Gesser, Wong, & Reker, 1987–1988). A review of studies on older adults' death anxiety generally supports Gesser and colleagues; death-related anxiety declines after midlife, stabilizes around age 60, and does not continue to decline in later life (Fortner & Neimeyer, 1999). However, when examining specific components of death anxiety, older adults' age was negatively correlated with fear of premature death and positively correlated with fears concerning the fate of the body after death (e.g., cremation, use in medical research); in this case, looking at overall death anxiety seemed to suggest no association with age, but examining the subscales revealed a different story (DePaola et al., 2003).

Given the complexities of death and dying processes, the study of explicit death anxiety benefits from conceptualizing death-related anxiety as a multidimensional issue that is further complicated by increased opportunity for varied experiences over the course of a longer life span. Indeed, DePaola et al. (2003) suggest that variability is the norm for older adults, and variability in older adults' experiences is likely to impact explicit death anxiety. For example, both physical and psychological problems correlate positively with death anxiety for older individuals (Fortner & Neimeyer, 1999). Most studies

addressing death anxiety have included older adults living independently in the community, but older residents of care facilities are more vulnerable to physical and psychological health problems and may have different attitudes about death as a result. The few studies that do include residents of care facilities, reveal that death anxiety is higher among older adults living in residential facilities compared with older adults living independently in the community (e.g., Azaiza, Ron, Shoham, & Gigini, 2010; Missler et al., 2011–2012). These findings, though limited, may indicate that the physical and cognitive declines that led to residency in a nursing home contribute to death anxiety. However, the experience of moving to such a facility is not accounted for in this work. Clearly there are several physical, cognitive, and social components of aging that could contribute to death anxiety, and it is likely that complex factors related to death itself contribute as well.

To address different aspects of death anxiety in older adults (aged 60–100), Cicirelli (2002) used the Fear of the Unknown and Fear of the Known, derived from the Multidimensional Fear of Death Scale (MFDOS; Hoelter, 1979). The Fear of the Unknown subscale assesses anxiety about nonexistence and annihilation of the self. A composite score for Fear of the Known was based on the remaining seven subscales of MFDOS (Fear of the Dying Process, Fear of the Dead, Fear of Being Destroyed, Fear for Significant Others, Fear of Conscious Death, Fear for the Body After Death, and Fear of Premature Death). Most relevant to TMT, greater levels of religiosity, self-esteem, social support, internal locus of control, and socioeconomic status were associated with lower Fear of the Unknown. With the exception of social support, the same factors were also associated with lower Fear of the Known. Cicirelli interpreted these findings as largely supportive of TMT and suggested that greater resources—whether they be religious, monetary, or social—were associated with more effective buffering from death-related anxiety, including lower fear of known and unknown aspects of dying. The findings from the literature on self-reported death anxiety, though informative, did not employ the typical experimental methods for investigating terror management processes, leaving unanswered questions of whether older adults would be more adept at handling increased awareness of death or more vulnerable to its effects. Research using traditional TMT methods (see Chapter 4, this volume) is needed to understand older adults' response to mortality salience.

TMT RESEARCH WITH OLDER ADULTS

As noted, older adults are typically exposed to reminders of mortality (their own or the mortality of their contemporaries) with increasing frequency, so they may be in a state of constantly heightened death-thought accessibility. There is also reason to believe that the anxiety-buffering system is altered during the course of the aging process; these changes may be detrimental or

beneficial, and they may vary in intensity and impact on coping with mortality. We have also seen the ways in which the aging process brings benefits of life's experience, positively impacting emotional experiences, interpersonal relationships, and self-esteem. In beginning this research with older adults, it was unclear whether the increased frequency and salience of mortality would result in habituation to death reminders (no reactions), heightened defensiveness, or decreased defensiveness. In reviewing the TMT and aging literature, the type of response appears to depend, at least in part, on whether thoughts of death are conscious or unconsciously accessible (see Chapter 2, this volume) and the specific age-group under scrutiny.

Distal defenses. Studies examining older adults' distal defenses indicate that they are not immune to the effects of cognitively accessible, yet unconscious, thoughts of death (i.e., mortality salience). In an initial study investigating age differences in recommended punishment to individuals who had violated social norms, results indicated that a subtle reminder of mortality resulted in greater punitiveness in young adults (as previously observed in Florian & Mikulincer, 1997) and lower punitiveness in older adults compared to control conditions (Maxfield et al., 2007; Study 2). Though older adults were more punitive overall, they showed lower punitiveness following exposure to a subtle death reminder. Several possible explanations for older adults' more positively oriented response to mortality salience were entertained and examined, and a follow-up study revealed that older adults' executive functioning moderated this effect. Executive functioning is a broad term which includes a variety of complex cognitive processes, such as decision-making, reasoning, inhibition, self-awareness, and self-monitoring (Stern, Andersen, & Gavett, 2011), which were hypothesized to be necessary for older adults to engage in less defensive, more positive responses to mortality salience. In support of this idea, greater executive functioning predicted older adults' more lenient responses to moral transgressors, but did not influence young adults' responses, as they rated transgressions with greater severity following a mortality reminder, regardless of their executive functioning status (Maxfield, Pyszczynski, Greenberg, Pepin, & Davis, 2012). Interestingly, lower executive functioning among older adults in the mortality salience condition was associated with greater punitiveness, similar to the effects observed in young adults reminded of mortality. Notably, memory, religiosity, psychological well-being, and self-reported physical health did not moderate young or older adults' responses to mortality salience. The finding highlights the specific importance of executive functioning in displaying positive responses to death and aligns with social-cognitive research concerning the positivity effect in later life (e.g., Carstensen & Mikels, 2005). It may also suggest that mortality salience intensifies or activates positivity effects. As noted, some cognitive decline in later life is inescapable, but maintenance of the complex executive abilities appears to be essential for positive adaptation to aging.

Perhaps, then, with age, people generate other means for maintaining self-esteem and faith in the cultural worldview or develop different worldviews altogether. As suggested by SST, it may be that people are seeking out more emotionally fulfilling experiences and relationships. Erikson (1950/1963) suggested that as people enter midlife and beyond, their focus on the self is decreasing in tandem with increasing attention to the surrounding community and future generations, which he termed generativity. Kotre (1984) further specified types of generativity (biological, parental, technical, and cultural), and suggested that different forms of generativity are more appropriate and accessible at different points in the life span. Biological generativity, characterized by procreation, is most readily available in early adulthood. Whereas cultural generativity, characterized by the transmission of cultural values and knowledge, may be most accessible for middle-aged and older adults. We reasoned that if passing on the benefits of one's knowledge and values is motivated, at least in part, by older adults' (im)mortality concerns, then this strategy would be especially prominent when reminded of death. In two studies, mortality salience resulted in greater generative concern among older adults compared to young adults; interestingly, older and young adults' generative concern did not differ in the control conditions, only in the mortality salience condition (Maxfield et al., 2014). Similarly, within an older adult sample, mortality salience effects on generative concern were maintained after controlling for preexisting levels of generative attitudes (e.g., Major, Whelton, Schimel, & Sharpe, 2016). Because engaging in volunteerism and generative activities have positive emotional effects among older adults (Brown, Consedine, & Magai, 2005; Tang, Choi, & Morrow-Howell, 2010), this finding is of particular interest in considering the positive impact of mortality awareness on daily life.

Proximal defenses. As noted earlier, older adults' distal defenses to the nonconscious activation of death-thoughts have generally differed from young adults (with the exception of older adults with lower executive functioning), showing a more positively oriented response after mortality salience inductions. If a similar pattern of age differences emerged with proximal defenses, one would expect to see that older adults would display fewer efforts to distance the self from death when death-thoughts are in focal attention. Such a pattern could result in underestimations of life expectancy or decreased intentions to engage in health-promoting behavior. These suggestions sound counterintuitive, but one could hypothesize that older adults, having reached their seventh and eighth decades of life, feel more comfortable acknowledging the limitations of the life span and perhaps indulging in less healthy behaviors, if they view the end is near. On the other hand, if older adults maintain the same orientation toward continued existence, they would be expected to respond to mortality reminders with similar types of proximal defenses as young adults (e.g., increased health intentions).

Initial findings related to proximal defenses suggest a role for personality in understanding how older adults cope with mortality. As a personality trait associated with greater tendencies for fear and anxiety, individuals with higher levels of neuroticism have generally shown more extreme reactions to reminders of mortality (e.g., Goldenberg, Pyszczynski, McCoy, Greenberg, & Solomon, 1999). Among young-old (ages 57–72, $M_{age} = 66.38$) and old-old adults (ages 73–87, $M_{age} = 77.68$), responses to mortality salience varied according to level of neuroticism (Maxfield et al., 2010). First, considering old-old individuals, life expectancy did not differ, regardless of neuroticism or mortality primes. These findings may be indicative of death acceptance in the final stages of life (among old-old individuals). However, young-old individuals with greater levels of neuroticism estimated their life expectancy to be longer after a mortality prime compared to a control condition. This response is similar to that expected from young adults—increased distancing from death. Conversely, young-old individuals with low levels of neuroticism responded to mortality primes with shorter life expectancy compared to those in a control condition. Neuroticism then appears to moderate responses to mortality among young individuals (e.g., Goldenberg et al., 1999), as well as young-old adults, but is less relevant for old-old adults. Notably, a period of delay and distraction was included after the mortality prime in this study, raising the question of whether this estimation of one's life expectancy was a proximal defense in the sense of timing, though it is clearly a proximal defense in terms of literally trying to distance one's self from death by overestimating one's life expectancy. More research is needed to make firm conclusions, but the emergence of a proximal defense in what is typically the distal mode (with delay and distraction) raises the possibility that the timing of mortality salience effects in older adults differs from that of young adults, perhaps the result of slower processing speed in later life (Salthouse, 1996).

As a salient issue for older adults, health and health-related intentions are a form of proximal defense that is of particular interest for aging and terror management research. The terror management health model (TMHM; Goldenberg & Arndt, 2008) suggests that when death-related thoughts are in conscious awareness, proximal defenses are enacted; in these instances, health-related intentions can become greater and act as a rational defense against death. However, when thoughts of death are present, yet outside of conscious awareness, distal defenses are activated; in such instances, health-related intentions vary because the chief concern is maintenance of self-esteem. To illustrate, college-aged participants indicate greater intention to use sunscreen (health protection) immediately after a death reminder; however, when primed with imagery highlighting the attractiveness of tanned skin, participants indicate lower intention to use sunscreen (self-image protection) after a death reminder and a delay (Routledge, Arndt, & Goldenberg, 2004). The TMHM has not been thoroughly tested with older adults; because this age-group is generally more likely to have significant

health problems compared to young adults, it may be that their health-related motivations differ as well. A handful of studies examining the roles of age and mortality awareness in health-related intentions reveal mixed results. Taubman-Ben-Ari and Findler (2005) found older adults showed lower intentions for healthy behaviors immediately after death reminders compared to a control condition, whereas both young and middle-aged adults indicated greater intentions for healthy behaviors immediately following a mortality prime. Bözo, Tunca, and Şimşek (2009) also found older adults' health intentions did not differ immediately following a mortality salience induction. These studies were limited by the inclusion of relatively "young" older adults (51–65, $M_{age} = 56.25$ and 60–80, $M_{age} = 63.9$, respectively), and, in the case of Bözo et al., an unusually explicit mortality salience induction, in which participants imagine themselves as the protagonist in a graphic death scenario. A study with an older sample of adults (60–89, $M_{age} = 72.98$) provides support for TMT and TMHM, such that both young and older adults showed greater healthy intentions immediately after a mortality salience induction, when death was in conscious awareness (Bevan, Maxfield, & Bultmann, 2014). In other words, both age-groups were motivated to distance themselves from death via intentions for healthy behaviors. However, the variation in results from multiple studies highlights the need for research concerning the impact of age and death awareness on health intentions, particularly given variability in responses across the adult life span. Consideration of older adults' present health status as a potential moderating variable may also help explain varied results in health-related intentions. Finally, identifying important aspects of older adults' self-image may also assist in fully testing TMHM in older adults, allowing for assessment of health protection and self-image protection following mortality salience.

Taken together, findings concerning older adults' terror management processes suggest that they are not immune to the effects of mortality salience, though they do respond differently in some situations when compared to young adults. Specifically, it may be that the accumulation of experience has led to the differences in distal defenses. In contrast, there are some indications that proximal defenses follow similar trajectories for both older and young adults, though the evidence is mixed. This combination of findings highlighted the need for clarity regarding the factors contributing to similarities versus differences between young and older adults' responses to mortality salience and led to the question of whether these age-groups process mortality-related stimuli differently at a very basic level. Event-related potentials and specifically the late positive potential (LPP) offer a means for assessing basic attentional processing of death-related stimuli. The LPP waveform component was of particular interest in this study because of its association with increased attention to emotional and motivational significance of stimuli (for a review, see Hajcak, MacNamara, & Olvet, 2010), including emotional words (e.g., Kissler, Herbert, Winkler, & Junghöfer, 2009). Older and young adults' LPP

waveforms were assessed as they were exposed to death-related, negative nondeath-related, and positive words (Bluntschli, Maxfield, Grasso, & Kisley, 2018). Older adults showed lower overall reactivity to emotional words than young adults, but this varied by category. Death-related words elicited the greatest LPP amplitude from young adults, compared to both negative and positive words. However, for older adults, negative words elicited the greatest reaction, relative to death-related and positive stimuli (which did not differ from each other). Subjective ratings of the words' valence and arousal did not vary by age, suggesting that age-related differences in responses to death-related stimuli exist very early in cognitive processing. Although these findings contribute to the understanding of age-related differences in responses to death concerns, additional research concerning the basic neural processing of death-related stimuli (see Chapter 16, this volume), as well as potential alternative explanations for the differences in young and older adults' terror management processes (e.g., changes in cultural worldviews, self-esteem, and social-cognitive processing), will promote better understanding of means for coping with existential anxiety in middle-age and later life.

PRACTICAL IMPLICATIONS

If reminders of death contribute to greater leniency, generative concern, and health-related intentions among older adults, is thinking about death so bad? Perhaps not. Contemplation of existence and life's finitude as a means to improve life satisfaction and overall well-being is not a new concept. Many therapeutic approaches incorporate awareness of mortality and time limitations, as well as components of the anxiety-buffering system (e.g., values, self-esteem, and relationships) into treatment for a variety of psychological dysfunctions (for just a few examples, see Frankl, 1959; May, 1953; Shedler, 2010; Yalom, 1980). For older adults, in particular, it may be of great relief to address fears of death as part of continuing to focus on personal growth and meaning making, as well as promote resolution in interpersonal situations and connectedness. And for those who experience anxiety about mentioning mortality to an older adult, it might be worth considering the psychological strength of older adults reviewed here and acknowledge the simple fact that older adults are perhaps more aware of mortality than any other age-group (for obvious and good reason).

Indeed, there is some evidence to suggest that older adults do not go to the same lengths to avoid death-related stimuli as middle-aged older adults (de Raedt, Koster, & Ryckewaert, 2013) and, as noted earlier, death-related stimuli do not elicit the same attentional reactions for older adults as for young adults (Bluntschli et al., 2018). Further supporting the shift in death-related attitudes, older adults report greater acceptance of death as "part of life" compared to middle-aged and young adults (e.g., Gesser,

Wong, & Reker, 1987–1988). In fact, it may be helpful for older adults to be able to discuss their thoughts and fears about death—not only as an emotional release, but also as a means to initiate important planning as well as reprioritization of personal goals. Specific to planning, if older adults are more accepting of and less defensive in response to death-related reminders, they may be open to completion of end-of-life planning, including advanced directives and appointing medical power of attorney. Such preparation can alleviate decision-making during crisis situations, and deliberate and thoughtful planning about one's own dying and death may allow for a greater sense of calm and the ability to ensure care that is consistent with the individual's own values and choices, rather than emotional responses of family members or life-saving responses of health care staff that are often made during an emergency. Similarly, contemplation of mortality in the context of financial planning may promote values-consistent distribution of material possessions, which may promote optimization of emotional goals in later years and prevent the need for significant financial decision-making under duress. Such planning is often associated with older age; however, based on terror management research with young adults, it is easy to imagine that the mortality reminder inherent in meeting with an attorney to complete one's will may create the potential for death anxiety and avoidance of this important planning activity. TMT would suggest that planning that affords an opportunity to affirm one's worldview and/or self-esteem may be less anxiety-provoking for individuals of all ages, perhaps increasing the likelihood of engaging in medical and financial planning for end of life.

The practical issues of ageism are important to consider as well. Although there is limited terror management research concerning ageism, the studies that do exist (e.g., Martens et al., 2004; O'Connor & McFadden, 2012) are consistent in showing that older adults arouse mortality concerns and that attitudes toward older adults can be negatively affected by mortality salience. Further, extensive research on ageism and attitudes about aging suggests that older adults are admired in some instances, but primarily pitied and avoided by many young adults and even older adults themselves. As with most prejudicial attitudes, exposure to and interaction with members of the targeted group reduces negative evaluations. Intergenerational contact has been associated with lower levels of ageism in young adults in both correlational (e.g., Kahana et al., 1996) and experimental work (e.g., Drury, Hutchison, & Abrams, 2016). Whether or not such contact with older adults impacts young adults' death-thought accessibility is not currently known. Although intergenerational contact appears to have a positive influence on attitudes toward older adults (at least in the short term), the change in ageism does not necessarily wipe out the association of older adults with mortality, raising the question of whether beliefs and attitudes about older adults would moderate awareness of mortality.

CONCLUSIONS

Although comparatively small in volume relative to the vast TMT literature, terror management studies concerning ageism and late adulthood offer an emerging picture of late life as a reminder of mortality to young adults and a period in which older adults' responsiveness to mortality continues—though in somewhat different ways. Older adults elicit reactions from young adults that are similar to that of a death reminder, experience multiple reminders of their aging and changing bodies, are faced with multiple challenges to the anxiety-buffering system, and live in a society in which ageism is common (including their own attitudes regarding aging), yet many older adults are experiencing later life as a period of strong social and emotional health. Given the potent and frequent challenges to older adults' sense of self, vitality, competence, and usefulness, it is that much more impressive that many (though certainly not all) older adults appear to have developed adequate means for managing existential terror. However, it is notable that all reported terror management findings included individuals living independently and maintaining the ability to participate in research. Indeed, higher levels of executive functioning are associated with less defensive responses to mortality reminders among older adults (Maxfield et al., 2012), suggesting that adequate cognitive resources are needed to engage in and display more positively oriented responses to mortality. This finding aligns with dynamic integration theory (Labouvie-Vief, 2009) and the SAVI model (Charles & Luong, 2013), and presents the unavoidable truth that aging and older adulthood present a series of challenges that are met with both the wisdom of experience and the existence of age-related limitations. In this sense, older adults with fewer physical, cognitive, and social resources are likely to be more vulnerable to the negative effects of mortality salience. Given the inherent variability in aging experiences (physical, cognitive, and social) and the diverse physical and psychological aspects of death and dying, continued research can help identify circumstances under which increased awareness of mortality is likely to promote personal growth versus overwhelming challenges in later life.

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Chapter 18

Terror Management Theory and Psychological Disorder: Ineffective Anxiety-Buffer Functioning as a Transdiagnostic Vulnerability Factor for Psychopathology

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Perhaps this is the bottom line to mental illness: incomprehensible events occur; your life becomes a bin for hoax-like fluctuations of what used to be reality. And not only that—as if that weren't enough—but you. . .ponder forever over these fluctuations in an effort to order them into a coherency, when in fact the only sense they make is the sense you impose on them, out of necessity to restore everything into shapes and processes you can recognize. The first thing to depart in mental illness is the familiar. And what takes its place is bad news because not only can you not understand it, you also cannot communicate it to other people.

Philip K. Dick, *VALIS* (1981/2011, pp. 19–20)

Mental health problems are ubiquitous to the human condition—from the transient experience of negative emotional states such as mild depression, to more extreme conditions, such as schizophrenia or posttraumatic stress disorder (PTSD). As knowledge and research on the nature and treatment of psychological disorders grows, commonalities in their latent structure (e.g., Brown, Chorpita, & Barlow, 1998), etiological processes, and effective treatment have led some researchers to consider transdiagnostic conceptualizations of such disorders (e.g., Barlow, Allen, & Choate, 2004;

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McEvoy, Nathan, & Norton, 2009). Iverach, Menzies, and Menzies (2014) recently reviewed a large body of research suggesting that death anxiety plays an integral role in psychopathology (see also Becker, 1973; Yalom, 1980), leading them to propose death anxiety as an especially pervasive transdiagnostic vulnerability factor. But why are some people more troubled by death than others?

Following James (1896), terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986; Pyszczynski, Solomon, & Greenberg, 2015; Solomon, Greenberg, & Pyszczynski, 1991, 2015) views the problem of death as the "worm at the core" of the human condition that drives much of what people want and do in life. From this perspective, people protect themselves from death anxiety by maintaining the meaning provided by their cultural worldviews, the self-esteem they acquire by believing they are living up to the standards of their worldviews, and close interpersonal attachments. Attachment bonds are both the foundation from which meaning and self-esteem initially acquire their anxiety-buffering capacities, and a major source of consensual validation needed for these entities to provide effective protection from anxiety. Thus, from a TMT perspective, death is especially problematic for individuals with poorly functioning anxiety-buffers; that is, for those who have difficulty maintaining meaning, self-esteem, and close relationships, or for those for whom these psychological entities lack the capacity to provide emotional security.

In this chapter, we build on Iverach et al.'s (2014) suggestion that death anxiety is a common thread underlying diverse psychological problems by using TMT as a point of departure for understanding why the universal existential problem of human mortality is more troubling for some than other people, and ultimately leads to psychological disorder. After a brief overview of TMT and the evidence supporting its central propositions, we consider the role of each component of the anxiety-buffering system (attachment, self-esteem, and meaning) in psychological disorder. We then discuss factors that can lead to inadequate development of an effective anxiety-buffering system and how traumatic life events can disrupt the effectiveness of this system over the course of the lifespan. Along the way, we review research linking problems maintaining faith in one's cultural worldview, self-esteem, and close interpersonal relationships to diverse forms of psychological disorder, and the role that the increased accessibility of death-related thoughts and anxiety play in these problems.

ANXIETY AND THE PROBLEM OF DEATH

The central role that anxiety plays in psychological disorder was one of the most enduring contributions of Freud and his followers. Freud (1926) characterized anxiety as a product of physical helplessness in situations of known dangers (realistic anxiety), psychological helplessness in situations

of unknown dangers (neurotic anxiety), or conflict between the ego and superego, in which basic biological needs run counter to social or moral mores (i.e., moral anxiety). Freud's insight that psychological problems result from maladaptive ways of attempting to cope with anxiety is reflected in countless theories of psychological disorder emanating from diverse schools of psychological thought—including psychodynamic, behaviorist, cognitive, biopsychological, existential, and humanistic conceptualizations. Recent research is consistent with this general idea, documenting anxiety as a common feature of a variety of psychological disorders (e.g., Naragon-Gainey, 2010) and suggesting that many emotional disorders share more similarities than differences (e.g., Wilamowska et al., 2010; see also Andrews, 1996; Brown, Campbell, Lehman, Grisham, & Mancill, 2001).

Though Freud emphasized conflicts between libidinal desires and internalized social norms as the primary source of psychological distress, existential psychologists (e.g., Binswanger, 1963; Yalom, 1980) posit that confrontation with the basic realities and limitations of the human condition is an even more ubiquitous source of anxiety. Becker (1971, 1973, 1975), the most proximal inspiration for TMT, posits that awareness of the inevitability of death in an animal endowed by natural selection with a diverse array of systems to maintain life creates the potential for overwhelming terror; and that this terror would make effective goal-directed behavior impossible and daily experience extremely aversive unless effectively managed. Weems, Costa, Dehon, and Berman (2004) summarized Paul Tillich's ideas about the existential problem of death as "an objectification of the anxiety of non-being" (p. 384). More recently, Langs (2004) identified death anxiety as "the single most powerful unconscious psychodynamic dynamism in present day emotional life" (p. 32). TMT provides a framework for understanding the relationships among culture, meaning, self-esteem, interpersonal relationships, anxiety, and awareness of the inevitability of death, which sheds light on the etiology and maintenance of a diverse range of psychological disorders.

Building on Becker's (1971, 1973, 1975) seminal books, TMT starts with a consideration of how human beings are both similar to and different from all other animals. Like all living things, humans are born with an array of biological and psychological systems that evolved because they helped keep their ancestors alive long enough to reproduce, pass on their genes, and care for their offspring so these genes could be passed on to future generations. Unlike other animals, humankind also evolved sophisticated intellectual abilities that serve a variety of adaptive functions, especially increasing the flexibility of their behavior so they could survive and prosper in diverse and rapidly changing environments. These intellectual abilities made awareness of the inevitability of death inevitable, which, because of the strong inclination to stay alive, created the potential for terror. This terror put a "press" on the explanations for reality that our ancestors were developing with their newly evolved intellectual capacities. Ideas that helped manage this terror

were especially appealing, likely to be communicated with others, and eventually institutionalized as cultural worldviews.

Cultural worldviews give meaning to life and the potential for one's own life to have value, which combine to provide a means of detoxifying death. They provide explanations for how the world works, standards for valuable behavior, and the hope of transcending death, either literally or symbolically, to those who are confident in the veracity of their worldviews and that they are living up to its standards. From the perspective of TMT, cultural worldviews and self-esteem work together to provide a cultural anxiety-buffer that protects people from the potential for anxiety inherent in the human condition that results from awareness of the inevitability of death. Psychological equanimity is thus based on ideas, beliefs, and values, that is, products of the human imagination that result from using our sophisticated intellect to understand the world in which we live.

In order for our worldviews and self-esteem to provide effective protection against anxiety, people must be confident in their veracity and validity. People maintain faith in these psychological shields through the process of consensual validation: when others agree with us, our faith is increased and we are better protected from anxiety, when others disagree with us, our faith is decreased and our vulnerability to anxiety increases. This is one reason why maintaining connections with and staying in the good graces of others is so important for people. In addition, attachment to other people is important because of the protection from anxiety that attachment provides in its own right (Mikulincer, Florian, & Hirschberger, 2003). TMT posits that the anxiety-buffering function of self-esteem and cultural worldviews develop through the attachment and socialization processes (for a thorough discussion of how this occurs, see Pyszczynski et al., 2015; Solomon et al., 2015; Chapter 10, this volume).

Hundreds of studies conducted in diverse countries and cultures have supported hypotheses derived from TMT (for recent reviews, see Greenberg, Vail, & Pyszczynski, 2014; Pyszczynski et al., 2015). These studies have shown that: (1) increasing self-esteem reduces self-reported anxiety, physiological arousal, and death-denying defensive distortions (e.g., Greenberg et al., 1990); (2) reminders of death [mortality salience (MS); see Chapters 1 and 4, this volume] increase defense of one's worldview and striving for self-esteem and close interpersonal relationships (e.g., Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989); (3) threats to one's worldview, self-esteem, or attachments increase the accessibility of death-related thoughts while bolstering any of these entities decrease death-thought accessibility (DTA; e.g., Schimel, Hayes, Williams, & Jahrig, 2007); and (4) increasing belief in an afterlife reduces DTA and defensive responses to MS (e.g., Dechesne et al., 2003). Research assessing the role of terror management processes in psychopathology typically uses one or more of these general tactics for documenting the role played by death concerns and problems with this anxiety-buffering system in psychological dysfunction.

PSYCHOLOGICAL DISORDER AND INEFFECTIVE ANXIETY-BUFFER FUNCTIONING

Building on the many previous theories that view psychological disorders as resulting from maladaptive attempts to manage a surplus of anxiety (e.g., Freud, 1926; Yalom, 1980), TMT suggests that psychopathology occurs when one is unable to effectively use one's cultural worldview, self-esteem, and close relationships to manage existential terror. From this perspective, the potential for anxiety is an ongoing problem for human beings, due to the juxtaposition of their fierce determination to stay alive with their knowledge that they must eventually die—and that death can come at any time due to any number of none-too-pleasant misfortunes. Sometimes this anxiety is consciously experienced as death related, as in the case of worries about health, bodily functions, aging, or the many possible things that could lead to one's demise (disease, violence, accident, natural disaster). More often, the conscious experience of anxiety is tied to threats to one's anxiety-buffer—relationship problems, failures in life domains in which one has invested self-esteem, or challenges to one's beliefs, values, or sense that life "makes sense." From the perspective of TMT, people experience anxiety either when thoughts related to death become highly accessible or intrude into consciousness, or when one or more of the three components of the anxiety-buffering system are threatened. Anxiety leads to psychological dysfunction when one is chronically unable to use one's worldview, self-esteem, or interpersonal relationships to effectively manage it, and consequently experiences intense distress and/or pursues maladaptive ways of reducing or averting this distress.

Some people have problems with anxiety because their anxiety-buffers never developed in the first place, or developed in suboptimal ways. Problems with attachment, self-esteem, meaning-making, and forming or maintaining a coherent and stable identity in childhood and adolescence can undermine the development of an effective anxiety-buffering system. This is often manifested as chronic attachment, anxiety, or personality disorders (e.g., Carlson, 1998; Ehntholt, Salkovskis, & Rimes, 1999; Kyrios, Nelson, Ahern, Fuchs, & Parnas, 2015; Shorey & Snyder, 2006).

In other cases, problems occur because people's buffers are rendered ineffective by stressful or traumatic life events. This is the central proposition of anxiety-buffer disruption theory (ABDT; Pyszczynski & Kesebir, 2011; Pyszczynski & Taylor, 2016), which posits that traumatic life events lead to PTSD when they disrupt effective anxiety-buffer functioning (see also, Janoff-Bulman, 1992). Though initially focused on understanding PTSD and responses to trauma, the fundamental concept of ineffective anxiety-buffer functioning applies to the broader array of etiological processes in psychopathology that are the focus of this chapter (see also Maxfield, John, & Pyszczynski, 2014).

In most cases, psychological disorders result from a combination of impoverished anxiety-buffer development and recent negative life experiences. Poorly developed anxiety-buffering systems leave people especially susceptible to compounding mental health issues in response to stressors in later life. Research shows that people with insecure attachment and adverse childhood experiences are significantly more likely to develop psychological disorders in response to traumatic experiences (e.g., Twaite & Rodriguez-Srednicki, 2004; Whiffen & MacIntosh, 2005). Research also shows that prior stressors or traumatic experiences are risk factors for the development of PTSD following traumatic experience in adulthood (e.g., Ozer, Best, Lipsey, & Weiss, 2008), and that cumulative adverse childhood experiences negatively impact a wide range of physical and mental health problems (e.g., Felitti et al., 1998).

Causes and Consequences of Individual Differences in Anxiety-Buffer Functioning

Difficulties with attachment, inconsistent parenting, rejection from peers, and other adverse childhood experiences likely combine with genetically transmitted temperamental factors to produce underlying individual differences in the capacity to defend against anxiety and particular psychological maneuvers used to do so. Dispositional traits, such as neuroticism (the tendency to experience negative affect, impulsivity, and emotional instability; Costa & McCrae, 1992) and low openness to experience, are associated with especially vigorous responses to existential concerns (e.g., Boyd, Morris, & Goldenberg, 2017; Landau, Sullivan, & King, 2010). Studies have shown that trait neuroticism is associated with greater aversion to bodily processes such as menstruation, lactation, elimination, and sex, especially after reminders of death (see Chapter 9, this volume). Recent research has also shown that low openness to experience is associated with more defensive reactions to reminders of death (Boyd et al., 2017), perhaps because thoughts of death evoke feelings of curiosity among those high in openness to experience. Furthermore, research has shown that traits such as neuroticism (e.g., Lahey, 2009) or anxiety sensitivity (e.g., Naragon-Gainey, 2010) underlie a wide range of psychological problems, and anxiety disorders in particular (Andrews, 1996; Andrews, Stewart, Morris-Yates, Holt, & Henderson, 1990). These traits often share underlying issues that relate back to the three major components of the anxiety-buffer.

Early issues with safety and trust associated with impeded development of attachment bonds can impact early manifestations of personality traits or dispositions, and research has found strong correlations between attachment styles and Big 5 personality traits (Costa & McCrae, 1992). For example, across two studies, Noftle and Shaver (2006) found that neuroticism was positively correlated with both attachment anxiety and avoidance, whereas

extraversion, openness, agreeableness, and conscientiousness were all negatively correlated with both attachment dimensions (not all correlations were significant in Study 2).

Not surprisingly, Big 5 personality traits have also been identified as predisposing factors in mental health issues. For instance, in a quantitative review conducted by Kotov, Gamez, Schmidt, and Watson (2010), significant effects of Big 5 traits (except openness) were observed to varying degrees across mood, anxiety, and substance abuse disorders, with high neuroticism showing the largest effects on psychopathology across the board. Indeed, high neuroticism has been found to be a significant predisposing factor for comorbidity among psychiatric disorders (e.g., Khan, Jacobson, Gardner, Prescott, & Kendler, 2005) and has been found to positively correlate with existential fears about individual death and dying, and the dying of others (Loo, 1984).

Yalom (1980) suggested that people often avoid confronting existential fears by transferring such concerns to more controllable, concrete objects, or situations. This appears to characterize pathology such as phobias, obsessive-compulsive disorder, and social anxiety problems. He noted:

> *Either because of extraordinary stress or because of an inadequacy of available defensive strategies, the individual who enters the realm called 'patienthood' has found insufficient the universal modes of dealing with death fear and has been driven to extreme modes of defense. These defensive maneuvers, often clumsy modes of dealing with terror, constitute the presenting clinical picture*
>
> Yalom, 1980, p. 111.

In line with Yalom,'s thinking, TMT theorists suggest that such disorders are the result of inefficient methods of managing existential anxiety that people resort to when more typical ways of managing distress are ineffective. In these cases, death anxiety is focalized onto avoidable objects (e.g., spiders, dirt, snakes) and activities (e.g., excessive hand-washing) to avoid confrontation with deeper fears regarding unchangeable realities of life—such as the inevitability of death. Across several studies, Strachan et al. (2007) found that reminders of death exacerbated pathological symptoms relevant to individuals' focalized fears. Specifically, MS prompted spider-phobics to avoid spending time viewing pictures of spiders (Study 1), triggered participants high in obsessive-compulsive symptoms to spend more time washing their hands following the application of gel on their fingers (Study 2), and led high socially anxious individuals to allot less time to join a group discussion (Study 3). Menzies and Dar-Nimrod (2017) recently replicated the finding that MS led to more vigorous and extended hand-washing among people seeking treatment for obsessive compulsive disorder (OCD); they also found that dispositional fear of death was positively associated with clinical ratings of OCD severity, frequency of hospitalizations, number of medications, and total number of anxiety-related diagnoses.

Personality disorders provide numerous examples of psychological dysfunction that signal problems associated with anxiety-buffer mechanisms. Two of the general criteria in the current edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association, 2013) for personality pathology include marked difficulties in interpersonal functioning and complications with self and identity that deviate from cultural expectations. For example, histrionic personality disorder presents as an obsessive need for social validation and perception of interpersonal relationships as much more intimate than they are, presumably to compensate for a fragile sense of self-esteem. Symptoms of this disorder are often found to cooccur with other personality pathology, such as borderline personality disorder (BPD). BPD is summarized in the DSM-5 as involving unstable self-image and sense of self, chronic feelings of emptiness, instability in interpersonal relationships, and dissociative symptoms, and has been conceptualized by some researchers as "a disorder of the self and of relationality" (Kerr, Finlayson-Short, McCutcheon, Beard, & Chanen, 2015, p. 346).

From the perspective of TMT, problems with self-esteem, an essential component of the anxiety-buffering system, should be an especially strong predictor of both emotional distress in response to existential threats and psychological disorders. Studies have shown that, when reminded of death, people with low self-esteem experience reduced feelings of vitality, decreased meaning, increased negative affect, and elevated levels of DTA (Routledge et al., 2010). Not surprisingly, low levels of self-esteem are associated with high levels of neuroticism e.g., Lester, 1990) and high levels of neuroticism are associated with both greater death anxiety and greater discomfort with one's body (Goldenberg, Pyszczynski, McCoy, Greenberg, & Solomon, 1999).

Indeed, low self-esteem and/or issues involving the self or identity pervade diagnostic features and symptom summaries in the DSM-5, and have been identified in a variety of disorders—from mood and anxiety disorders to BPD, and even schizophrenia (e.g., Kyrios et al., 2015). For example, Ehntholt et al. (1999) found significant relationships between low self-esteem, and symptoms of depression, obsessive-compulsive disorder, and anxiety. In a metaanalysis of longitudinal studies investigating the impact of self-esteem on depression and anxiety, Sowislo and Orth (2013) found that low self-esteem at one point in time significantly predicted later depressive symptoms, while low self-esteem and anxiety symptoms significantly predicted each other to a similar degree, thus suggesting a potentially reciprocal relationship between the two. That is, low self-esteem may increase symptoms of anxiety, and the inability to manage anxious symptoms may reduce individual's feelings of self-worth. Low self-esteem and low positive self-experience have also been linked to chronic fatigue syndrome in adolescents (van Geelen, Fuchs, van Geel, Luyten, & van de Putte, 2015), thus

demonstrating the seemingly ubiquitous role self-esteem plays in psychological dysfunction.

In a study of adolescents between the ages of 15 and 18, investigating the structure of adolescent existential concerns and their relationship to identity development and psychological symptoms, Berman, Weems, and Stickle (2006) found that indicators of problematic identity development were strongly related to greater preoccupation with existential concerns, such as fate and death, emptiness and meaning, and guilt and self-condemnation (concern about how one's life has lived up to cultural and personal standards). Higher levels of existential anxiety were significantly correlated with symptoms of anxiety and depression, particularly concerns regarding emptiness and lack of meaning.

To obtain and maintain self-esteem, one must navigate the set of desirable standards of behavior set forth by one's cultural worldview, as well as garner social validation substantiating one's achievement of these standards. Without a functional atlas of culturally defined values, beliefs, and meaning, there is no foundational path to self-esteem, and one may end up suspended in a type of existential limbo, lacking connection to themselves or others, and vulnerable to psychological dysfunction. Deficits in meaning create a situation like that produced by the sweeping dog in the 1951 Disney film, Alice in Wonderland, who sweeps away the forest path in front of and behind Alice, leaving her in darkness and despair. This scene serves as a metaphor for what occurs when individuals lose faith in their cultural worldviews—this creates the potential to become disillusioned with reality, with the "self," and with others.

Dissociative symptoms like depersonalization, a sense of disconnect or feeling detached from one's self or body, or derealization, the alteration or disruption of one's sense of reality or perception of the external world (American Psychiatric Association, 2013), stand as illustrations of such disillusionment, and dissociative symptoms are positively correlated with anxiety, depression, fear, and personality variables (e.g., Ball, Robinson, Shekhar, & Walsh, 1997). Fuchs (2015) suggested that problems with the "self" and identity emerge from disrupted self-awareness and have the potential to lead to more serious self- or ego-disorders. We can see this illustrated in the case of schizophrenia. Becker (1973) described the schizophrenic as one most burdened by the heavy weight of constant fear and anxiety, while feeling ultimately disconnected from the outside world, one's internal experience, and one's physical body.

In summary, individuals differ in both their temperamental irritability in response to potentially threatening stimuli and in the ways they respond to and cope with anxiety and other forms of distress. These dispositional response styles, rooted in both genetic predisposition and socialization experience, are likely associated with particular disorders that emerge when one is unable to cope with existential concerns in more adaptive ways. For example, high

levels of private self-consciousness are associated with depression (Smith & Greenberg, 1981) and paranoia (Fenigstein, 1997); perfectionism with OCD (Frost & Steketee, 1997); dissociative tendencies with PTSD (Ozer et al., 2008); and neuroticism with a wide range of anxiety, mood, and substance abuse disorders (Lahey, 2009). Perhaps these individual differences relate to particular disorders because they reflect how people respond to excess anxiety that results from deficiencies in their anxiety-buffers.

Weaknesses in anxiety-buffer components act as both antecedents and continuous contributors to suboptimal functioning, ultimately positioning individuals to be at greater risk of negative psychological consequences following adverse events later in life. Further, as difficulties with anxiety-buffer functioning crystalize across the developmental timeline, individuals become more vulnerable to the development of more severe psychopathology in adulthood. It is therefore imperative for future research to determine how people respond to vulnerabilities in their anxiety-buffers. Do they strive more vigorously to affirm them or withdraw from their sources of meaning, self-esteem, and relationship? And how does this relate to specific psychological problems?

Causes and Consequences of Weak or Inefficient Anxiety-Buffer Development

Humans are born into the world more helpless and vulnerable than other animals, with no way of defending themselves against starvation, danger from the elements, or death. Babies cannot feed themselves, provide clothing, and shelter for themselves, nor can they escape predators. They rely solely on the care of other human beings for their survival. Children are born with an innate proclivity to form attachment bonds with their primary caregivers in response to the affection they receive as their caregivers attempt to reduce their distress in response to signs of discomfort. As children mature, this affection and security become increasingly contingent on pleasing their parents by living up to the values of the cultural worldview to which their parents subscribe. These early attachment bonds with one's primary caregivers provide the earliest sense of physical and existential safety, and the view of the world as a safe and benevolent place. These are the seeds from which the more abstract system of meaning, self-esteem, and close relationships that adults use for emotional security grows. Though a thorough discussion of how attachment bonds lead to the emergence of capacity to manage anxiety by maintaining faith in one's worldview, self-esteem, and close relationships is beyond the scope of this chapter, these issues are discussed by Pyszczynski et al. (2015), Solomon et al. (2015), and in Chapter 10 of this volume. Shaver and Mikulincer (2012) and Mikulincer and Shaver (2008) provide a broader overview of the role of the attachment behavioral system in interpersonal relationship development and emotion regulation, and

Mikulincer et al. (2003) review the terror management function of attachment in romantic relationships.

The development of the attachment behavioral system and specific early attachment relationships are vital to anxiety-buffer development because of their impact on the ways children build and maintain self-esteem, understand the world they live in, find ultimate meaning in life, and develop and maintain interpersonal relationships across the lifespan. Development of secure attachment requires an affectionate and consistent caregiver who is responsive to the child's needs in a way that promotes a sense of basic trust and safety (e.g., Bowlby, 1969; Erikson, 1950; Rogers, 1951). The child first learns that "I'm safe because my parents love me," then "I'm especially safe when I'm good because that's when my parents love me the most," and eventually "I'm safe because I'm good." Of course, these are primitive experiential associations rather than verbally articulated inferences. Lack of parental affection and attention, lack of consistent approval for desirable behavior, and chaotic displays of negative emotion in response to the child can all undermine the emergence of positive self-image or the connection between self-esteem and emotional security.

As children's cognitive capacities increase, parents and other significant others explain the workings of the world, providing the basis for a verbally articulated worldview that builds on the primitive experiential associations that began developing well before the child is capable of language. This usually consists of comforting reassurances that the world is a benevolent and just place in which the child is safe because of he or she is valued and loved (Lerner, 1980). But this emergence of a benevolent worldview can be undermined if parents emphasize the dangerous and frightening aspects of life, or if what they say does not fit what the child experiences. Dangerous or chaotic life situations (e.g., violence, war, family discord) can also interfere with the emergence of a view of the world as safe and benevolent.

Our analysis suggests that early frightening caregiver behavior or traumatic exposure exacerbates difficulties in effective anxiety-buffer acquisition, undermines the development of self-esteem and a benevolent worldview, and leads to troubled interpersonal functioning through adolescence into adulthood. Although early childhood maltreatment research focused primarily on childhood sexual or physical abuse, more contemporary research has begun to uncover the powerful impact that emotional abuse and neglect have on developmental and adult psychopathology. This work shows how critical rejection, contempt, devaluation, and other derogation from attachment figures can diminish self-esteem and undermine the emerging identity of the child. For example, identity disturbance in BPD has been linked to disordered attachment, and emotional neglect and relational trauma (e.g., Kerr et al., 2015).

Similarly, parental bonding styles that employ excessive control tactics may also serve as a hindrance to anxiety-buffer development. While caregivers may believe that their efforts are helping to ensure that their children meet

cultural worldview standards and are protected from harm, from a TMT perspective, such excessive use of controlling tactics prevent children from feeling they are indeed successfully achieving parental standards of good behavior because of ongoing harsh or critical responses from the parent. The lack of validation from such a vital source of safety diminishes self-esteem and obstructs the child's evolving coping mechanisms. For instance, Finzi-Dottan and Karu (2006) found that emotional abuse, and to a lesser extent, problems with parental bonding strategies (e.g., excessive maternal/paternal control), significantly predicted low self-esteem and the use of more immature ego defense mechanisms (e.g., regression, projection) in adulthood; further, low self-esteem and increased use of such defenses significantly predicted adult psychopathological symptomatology. Research has found that those who report greater emotional abuse in childhood were 3.57 times more likely to develop personality pathology (e.g., borderline, schizoid/schizotypal, histrionic, obsessive-compulsive) in adulthood; 3.69 times more likely if they had experienced maternal neglect, and 3.14 times more likely if they had experienced maternal psychological aggression (Cohen et al., 2013).

As linguistically based worldviews emerge (see Chapter 25, this volume), children are exposed to a more diverse array of ideas and teachings about their world and how to live in it. Peers, teachers, religious leaders, stories, television, and other media sources exert increasingly important influences on children's emerging and evolving worldviews. The standards of value upon which their self-esteem is based become more explicit. This more diverse range of influences can cause confusion when they are inconsistent and can lead to unrealistic and unattainable standards for viewing oneself as a person of value. This, too, can impede the development of a well-functioning anxiety-buffer.

An important aspect of developing meaning and identity structures, and resulting pathways to self-esteem, comes from children's interpersonal relationships and socialization experiences with their peers. As they mature and develop, children increasingly transfer their source of attachment security from their parents to their peer groups. Evidence suggests that victimization by one's peers is an oft-cited precursor to anxiety. For example, Grills and Ollendick (2002) found that early peer victimization was significantly negatively correlated with global self-worth, and global self-worth was significantly negatively correlated with several domains of anxiety symptoms (e.g., physical symptoms, social anxiety) among sixth-grade preteens. These relationships demonstrate how negative socialization experiences in childhood can impede self-esteem development and overall anxiety-buffer functioning; peer groups are an important way of validating oneself as a valuable social contributor to a meaningful world.

Grills and Ollendick (2002) also found gender differences in the moderating/mediating relationships of global self-worth to peer victimization and anxiety symptoms, such that global self-worth mediated the relationship

between peer victimization and anxiety symptoms for girls but it moderated the peer victimization–anxiety symptom relationship for boys. Specifically, for girls, increased peer victimization decreased global self-worth, which led to increased anxiety symptoms; for boys, greater levels of peer victimization led to increases in self-reported anxiety symptoms only for those who had low levels of global self-worth. This suggests that young girls' developing self-esteem may be more vulnerable to early adverse interpersonal experiences, and thus, impair effective anxiety-buffer development; a notion that appears in line with research that suggests female gender is a risk factor in the development of various psychopathology (e.g., Zahn-Waxler, Shirtcliff, & Marceau, 2008) and PTSD following trauma exposure (e.g., Brewin, Andrews, & Valentine, 2000; Cox, Kenardy, & Hendrikz, 2008). Although a more thorough discussion of gender differences in psychopathology and anxiety-buffer development is beyond the scope of this chapter, further research investigating this topic and how these differences impact self-esteem expression in adolescence as a buffer for existential anxiety is needed.

Chronic peer victimization and bullying sometimes has more dire consequences, such as suicide—a tragic outcome made more prevalent due to the ever-increasing reach of technology and social media. According to the Centers for Disease Control and Prevention's 2015 Fatal Injury Data, suicide was the third leading cause of death in children between the ages of 10 and 14, and was the second leading cause of death in teenagers and young adults between the ages of 15 and 24 (Centers for Disease Control & Prevention, 2016). Cases of extreme cyber-bulling have led some adolescents to take their own lives following months or years of continued harassment via social media (e.g., Brandy Vela), which likely prompted feelings of rejection from important anxiety-buffering social groups and served to diminish self-esteem and, consequently, increased anxiety. As TMT suggests, it is not enough to strive toward meeting the behavioral standards of one's cultural ingroups; one must also obtain regular social validation to feel like a valued contributor to such groups. Sociologist Durkheim (1897) referred to the feelings of normlessness and meaninglessness that result from inadequate support from important social groups (e.g., family, community) as *anomie*, and that anomie was a "regular and specific factor" (p. 82) underlying modern suicide.

Empirical Evidence Regarding the Anxiety-Buffering Function of Attachment

Though much more research on the role of childhood attachment in terror management processes is needed, research with young adults has found that, after reminders of death, thoughts of one's parents reduce death-thought accessibility and increase feelings of self-worth; clearly, attachment relationships continue to operate as an important source of self-esteem that manages

existential anxiety in adulthood (Cox et al., 2008). Other research has shown that reminders of death lead people to exaggerate how positively their romantic partners view them and that priming thought of their partner's affection reduces DTA (Cox & Arndt, 2012). People who do not establish secure attachments or who experience other adverse events during childhood (e.g., peer victimization, trauma) may not be able to realize important anxiety-buffering developmental milestones, such as establishing a sound sense of self-worth or viewing the world as a safe, meaningful, and benevolent place (e.g., Janoff-Bulman, 1989).

This suggests that attachment style is likely to moderate a variety of death-related coping mechanisms (Mikulincer et al., 2003), with insecure attachment styles (i.e., anxious-ambivalent or avoidant) indicating suboptimal functioning of the anxiety-buffering potential of the attachment system. Consistent with this reasoning, research has shown that anxious-ambivalent individuals show greater overt fear of death than avoidant or securely attached individuals, and that both anxious and avoidant individuals exhibit stronger low-level awareness of death than secure individuals in a thematic apperception test (Mikulincer, Florian, & Tolmacz, 1990). Research has also found greater accessibility of mental images of important attachment figures when threatened, particularly for those with anxious attachment (Mikulincer, Gillath, & Shaver, 2002), as well as greater death-thought accessibility in anxiously attached individuals following primes of separation/death of one's romantic partner (Mikulincer, Florian, Birnbaum, & Malishkevich, 2002).

Attachment Style and Psychological Disorder

According to the DSM-5 (American Psychiatric Association, 2013), reactive attachment disorder is characterized by markedly disturbed patterns of attachment behaviors resulting from the inability or failure to develop secure attachment with caregivers. A review investigating the relationship between early parental bonding and psychiatric symptoms in adulthood found that neglectful or overprotective parenting increase the risk for developing anxiety, depression, and self-esteem issues in adulthood (Lima, Mello, & de Jesus Mari, 2010). Similarly, in a sample of Jewish settlers, Mikulincer, Horesh, Eilati, and Kotler (1999) found that anxious-ambivalent attachment was significantly positively related to greater psychiatric symptoms (e.g., somatization, obsessive-compulsive problems, psychoticism) and posttraumatic stress symptoms (e.g., intrusions, avoidance), while secure attachment was inversely related to such symptoms. Indeed, insecure attachment has been shown to be associated with a multitude of mental health issues, including depression, anxiety, and personality disorders (for a review, see Shorey & Snyder, 2006).

To the extent that close interpersonal attachments buffer anxiety, one would expect attachment style to influence coping with stressful and traumatic experiences. In a study investigating whether activating the attachment

system would buffer intrusive memories following exposure to traumatic content, Bryant and Foord (2016) found that when subliminally primed with attachment-related images prior to traumatic (e.g., bloody or dismembered bodies) or neutral images, individuals high in avoidant attachment reported more intrusive memories. Interestingly, they found that for participants high in anxious attachment, subliminally priming attachment images led to decreased recall of both traumatic and neutral images, thus suggesting that the hyperactivation of the attachment system that occurs for anxious individuals may impede memory formation—one of the central dysfunctions involved in the development and chronicity of PTSD (for a review, see Brewin, 2011). Indeed, greater activation of areas of the brain associated with social rejection, sadness, subjective distress of pain, and neuroticism, and greater deactivation in brain areas associated with emotion regulation, as well as greater access to negative memories, have been found in anxiously attached individuals following negative primes involving romantic partners (Gillath, Bunge, Shaver, Wendelken, & Mikulincer, 2005).

It is clear from the research discussed thus far that myriad forms of psychological dysfunction can be connected to the collapse of anxiety-buffering mechanisms aimed at protecting individuals from the problem of death. Ineffective anxiety-buffer functioning produces compensatory efforts that promote difficulties in daily functioning, and over time, can manifest in psychopathology, leaving individuals struggling, and often failing to keep death thoughts at bay. We turn now to a discussion of the dynamic impact of traumas that occur later in life, after one's anxiety-buffers are relatively well developed.

THE IMPACT OF TRAUMA: ANXIETY-BUFFER, INTERRUPTED

> *We are born in debt, owing the world a death. This is the shadow that darkens every cradle. Trauma is what happens when you catch a surprise glimpse of that darkness, the coming annihilation not only of the body and the mind but also, seemingly, of the world. Trauma is the savagery of the universe made manifest within us, and destroys not only the integrity of consciousness, the myth of self-mastery, and the experience of time but also our ability to live peacefully with others, almost as if it were a virus, a pathogen content to do nothing besides replicate itself in the world, over and over, until only it remains. Trauma is the glimpse of truth that tells us a lie: the lie that love is impossible, that peace is an illusion.*
>
> David J. Morris, *The Evil Hours: A Biography of Posttraumatic Stress Disorder* (2015, p. 41)

Anxiety-buffer disruption theory (ABDT; Pyszczynski & Kesebir, 2011) is an application of TMT explaining how traumatic experiences lead to PTSD. From this perspective, trauma-related disorders reflect a system-

wide breakdown of the anxiety-buffer brought on by traumatic life events. ABDT posits that when traumatic events undermine the capacity of one's cultural worldviews, self-esteem, and interpersonal attachments to manage anxiety, the person is left with overwhelming unfiltered anxiety that leads to the various symptoms clusters of PTSD. Hyper-arousal and extreme anxiety are direct effects of the lack of an effective shield against anxiety in a person who has experienced terrifying life events. This unbuffered anxiety leads to various forms of avoidance behavior, a second defining symptom cluster of PTSD. Avoidance paradoxically leads to recurring intrusive thoughts, flashbacks, and nightmares, as the person short-circuits naturally occurring and otherwise adaptive tendencies to work through, resolve, or make sense of the traumatic experience by actively suppressing thoughts related to the trauma or situations and cues associated with it (Wegner, 1994). The person is unable to integrate the traumatic experience into his or her worldview, in part, because the experience is a dramatic violation of core worldview assumptions that the world is a safe and benevolent place in which to live; this ineffective integration leads to distressing changes in cognition and thoughts about one's life. This onslaught of negative thought and emotion often leads to various attempts to numb oneself to these experiences, either through suppression of emotional experience or through the abuse of alcohol and other drugs. Thus from the perspective of ABDT, PTSD is a direct result of a shattered anxiety-buffer in people who have experienced a dramatic undermining of the core assumptions of their worldviews. Although on an unconscious level they are mobilizing to make sense of these experiences, the distress these thoughts produce lead to counterproductive efforts to avoid them that ultimately exacerbate one's symptoms.

While a single traumatic experience may not be enough to shatter the buffer, particularly for those who have strong anxiety-buffers to begin with (usually considered resiliency), cumulative exposure to stressful events, and the competing tendencies to approach and avoid them (e.g., Horowitz, 1976, 1979; Roth & Cohen, 1986), can fundamentally erode the ability of the anxiety-buffer system to work effectively. Individuals with weak anxiety-buffers are at greater risk for negative consequences of traumatic stress exposure, and may struggle to a greater degree in response to less severe traumas. Severity, chronicity, and complexity of psychopathological symptoms can be viewed as a function of weak buffer functionality compounded by exposure to trauma, and increasing degrees of trauma severity may further expound symptom severity. Consistent with this reasoning, prior life stressors have been found to be a predisposing factor for later PTSD development in combat-deployed soldiers (e.g., Polusny et al., 2011), and cumulative trauma in childhood predict PTSD symptom complexity in both child and adult clinical samples (Cloitre et al., 2009).

Trauma Exposure in Children

Due to their reliance on caregivers and relative inability to consistently identify threats and remove themselves from danger, children are at a particularly high risk of exposure to traumatic events (Fairbank, Putnam, & Harris, 2014; Lieberman, Chu, van Horn, & Harris, 2011; Lieberman & van Horn, 2009). In their review, Brown, Becker-Weidman, and Saxe (2014) found that children develop PTSD to a higher degree than adults following a traumatic event, and that more than half of documented abuse victims were under the age of 7 (p. 332). The evolving anxiety-buffers of children and adolescents are not yet fully robust to traumatic experiences and such exposure can undermine the anxiety-buffer's developmental progress, as well as produce more "detrimental effects on developmental trajectories than trauma occurring later in life" (Brown et al., 2014, p. 333).

Childhood trauma takes many forms, including emotional neglect, emotional abuse, physical abuse, sexual abuse, or witnessing violence within the home. Early abuse, neglect, and trauma involving caregivers can have a profound impact on attachment development, with intermittently available or unresponsive caregivers prompting the adoption of anxious, avoidant, and even disorganized/disoriented (Carlson, 1998; Lieberman, 2004) attachment styles. Disorganized attachment is characterized by simultaneous approach and avoidance behaviors, as well as inhibition behaviors (e.g., freezing), and is thought to emerge from an inability to seek safety from caregiver proximity due to "frightening or frightened caregiver behavior (that) has disrupted or interfered with the formation of a coherent pattern of attachment" (Carlson, 1998, p. 1107). Carlson found that this type of attachment was strongly correlated with childhood abuse and emotional neglect, as well as the expression of dissociative symptoms throughout development, and particularly with psychopathology and dissociation in young adulthood. Indeed, while traumatic-stress reactions in children may result from threat exposure, they are often the product of the inability to achieve important safety needs with attachment figures, as reflected in stage-specific developmental tasks (e.g., Pynoos et al., 2009; for a review, see Lieberman, 2004). Analogs to inadequacies in achieving safety needs related to frightened caregiver exposure, Samuelson and Cashman (2008) found that in environments where intimate partner violence occurred, the posttraumatic stress symptoms of the mother significantly predicted difficulties in children's emotion regulation, as well as children's internalizing and externalizing behaviors. Moreover, a metaanalysis investigating risk factors for psychopathology development in children exposed to trauma found threat to life and posttrauma parental distress to be the strongest predictors (Cox et al., 2008).

Childhood physical and sexual abuse are also strong predictors of psychological malaise. Studies investigating childhood sexual or physical abuse found them to be significantly related to insecure attachment, higher

dissociation, and more severe PTSD symptoms following exposure to a terrorist attack in adulthood (Twaite & Rodriguez-Srednicki, 2004), and to predict emotional distress that is mediated by ineffective coping and self-conscious emotions, such as shame and self-blame (e.g., Min, Farkas, Minnes, & Singer, 2007; Whiffen & MacIntosh, 2005). Diverse forms of childhood trauma have been found to significantly predict avoidant coping styles, substance abuse, and psychological distress (e.g., depression, hostility) in adulthood (Min et al., 2007). Considering the negative impact of trauma on meaning, emotion regulation, coping skills, and self-esteem, and the resulting chronic high levels of anxiety, it is not surprising that individuals turn to substance abuse (e.g., Ullman, Relyea, Peter-Hagene, & Vasquez, 2013) to manage their anxieties. From the perspective of ABDT, substance abuse is a maladaptive attempt to manage existential anxiety concerns following anxiety-buffer failure.

As we have seen, dissociation is a psychological reaction that may occur in the face of frightening situations, particularly in childhood. According to van der Kolk (2014), "dissociation is the essence of trauma" (p. 66), and dissociative reactions to a traumatic event are the brain's way of protecting itself from danger. However, as van der Kolk and others (e.g., DePrince, Chu, & Visvanathan, 2006) have noted, although dissociation may be adaptive in that it reduces distress in an overwhelming situation, it can create problems with memory encoding and retrieval of traumatic events—two cognitive problems often identified as contributors to the development and maintenance of PTSD (e.g., Brewin, 2011; Nijenhuis, van der Hart, & Steele, 2010). Indeed, high symptoms of psychoform dissociation (i.e., the psychological or cognitive manifestations of dissociation) have been found to partially mediate the relationship between multifacted childhood trauma and complex PTSD symptoms in adulthood (van Dijke, Ford, Frank, & van der Hart, 2015). The origins of dissociation are classically rooted in trauma (e.g., van der Hart and Horst, 1989), and dissociative processes have significant influence on the development of the self (for a review, see Carlson, Yates, & Sroufe, 2009) and the structural formation of personality (for a review, see Nijenhuis et al., 2010). Support for this connection comes from research showing that in a sample of patients referred for borderline personality treatment, those with higher levels of dissociation reported significantly higher severity of emotional abuse, physical abuse, emotional neglect, and physical neglect in childhood than those with low levels of dissociation (Watson, Chilton, Fairchild, & Whewell, 2006).

From the perspective of TMT, traumatic stress interferes with core worldview assumptions and undermines the ability of one's worldview to provide meaning and safety to protect individuals from existential anxiety. Dissociative processes sometimes subsequently occur as a means of psychological protection when individuals are unable to cope with the emotional distress of threatening events—that is, when anxiety-buffering mechanisms have been rendered unserviceable in defense against death-related thoughts.

Supporting this notion, Gershuny, Cloitre, and Otto (2003) found that the fear of death mediated the well-documented relationship between dissociation and PTSD symptom severity (e.g., Ozer et al., 2008); that is, when fear of death was accounted for, the relationship between dissociation and PTSD disappeared. ABDT further suggests that in cases where dissociation results from trauma at the hands of an important attachment relationship, the potential for disruption is intensified because one is no longer able to use this relationship as an anxiety-buffering source of safety.

In a study of adolescents (aged 13–15) 3–5 years following Hurricane Katrina, Weems, Russell, Neill, Berman, and Scott (2016) found that 87.5% of the sample reported anxiety related to at least one existential concern (e.g., fear of death or anxiety about meaninglessness). High levels of existential anxiety regarding meaninglessness, death, and guilt/condemnation were found to be significantly associated with PTSD symptom severity. Of particular interest, individuals with both high levels of trauma exposure and high levels of death-related anxiety reported especially high levels of PTSD symptom severity, suggesting a dose-dependent relationship where greater exposure to traumatic stressors is more likely to disrupt anxiety-buffer functioning and lead to both greater death anxiety and more severe PTSD. The authors also found that anxiety about existential concerns significantly predicted symptoms of depression, particularly for those with high levels of anxiety related to meeting cultural and personal standards of behavior (i.e., guilt/condemnation) and high exposure to trauma.

Adding to the evidence presented previously, trauma-related issues in attachment development, emotion regulation, dissociation, personality expression, maladaptive behavior, and exposure to traumatic stressors in childhood impede developmental progress (e.g., cognitive and interpersonal development), all present added challenges to anxiety-buffer development. Each of these factors have been shown to individually predict the development of PTSD following exposure to traumatic events in adulthood (e.g., Koenen, Moffitt, Poulton, Martin, & Caspi, 2007; O'Connor & Elklit, 2008), as well as cumulatively contribute to more complexity in traumatic stress symptomatology (e.g., van Dijke et al., 2015).

Trauma in Adulthood: Signs and Sequels of Anxiety-Buffer Disruption

Ineffective anxiety-buffer functioning is posited to lead to exacerbation of psychopathological symptoms and processes, and is often manifested by a lack of defense following MS (death primes) typically observed in those with healthy anxiety-buffers. For example, in a study using eye-tracking to measure attentional bias, Finch, Iverach, Menzies, and Jones (2016) found that when mortality was made salient, socially anxious participants demonstrated greater initial bias toward socially threatening faces than nonsocially

anxious participants. In two studies of adult survivors of the Cote *d'*Ivoire civil war, Chatard et al. (2012) found that when asked to think about the possibility of having been killed in the war, individuals with more severe PTSD symptoms reported greater immediate accessibility of death-related thoughts, but the opposite was observed in the control condition, where high PTSD symptom severity was negatively related to death-thought accessibility. These results suggest that while those with severe PTSD symptoms typically suppress death thoughts in normal situations (likely the product of avoidance symptoms), when confronted with death, they do not have the functional ability to protect against such thoughts as those with healthy anxiety-buffers have been found to do (see Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997). Chatard et al. also found that when reminded of death, survivors with greater war exposure reported more severe PTSD symptoms than in the control condition. Analogs to findings in Weems et al.'s (2016) study, these results indicate that greater exposure to traumatic stressors can weaken or disrupt the anxiety-buffer, and exacerbated symptoms in the face of death demonstrate how ineffective anxiety-buffer functioning contributes to psychopathology. Similar findings were reported by Edmondson et al. (2011): participants with medium to highly severe posttraumatic stress symptoms showed increased proximal death-thought accessibility following MS than in the control condition.

In addition to findings that suggest a dose–response relationship between trauma exposure and PTSD symptomatology, certain peritraumatic responses have been shown to impact traumatic stress outcomes and interrupt anxiety-buffer functioning related to worldviews and meaning. For instance, soldiers who experienced combat stress reactions—severe psychological breakdown involving rapid manifestations of symptoms (e.g., confusion, vomiting) that occurred in the midst of combat and thus preventing coping abilities—were found to have less faith in the benevolence of people than controls (Dekel, Solomon, Elklit, & Ginzburg, 2004), thus signaling a failure in core worldview assumptions. Additionally, veterans with a history of or current PTSD demonstrated reduced faith in the benevolence of others and the world, as well as lower feelings of self-worth than those without PTSD.

Following earlier discussions of the profound impact dissociation has in the etiological process of multiple psychological disturbances, it is no surprise that peritraumatic dissociation has been repeatedly identified as one of the strongest predictors of PTSD (Ozer et al., 2008), and a solid body of research indicates that dissociative processes signal disruption in anxiety-buffering processes. In a sample of New Yorkers, Kosloff et al. (2006) found that death reminders led to both increased reporting of peritraumatic dissociation related to the 9/11 terrorist attacks, as well as increased anxiety sensitivity, and that greater levels of dissociation mediated the effect of MS on anxiety sensitivity. The authors replicated these findings in a subsequent sample involving post-MS worldview bolstering, but results revealed that

while such bolstering reduced anxiety sensitivity, this effect was not observed for those with high levels of dissociation, thus indicating the disruption in anxiety protection that dissociative processes produce.

In a set of studies following the 2005 Zarand earthquake in Iran, Abdollahi, Pyszczynski, Maxfield, and Luszczynska (2011) found that when reminded of death, low dissociators, but not high dissociators, who had been exposed to the earthquake 1 month prior demonstrated expected increases in worldview defenses in response to reminders of either death or the quake. Further, high dissociators reported greater levels of negative affect, and low levels of positive affect following both MS and earthquake reminders; however, negative affect was significantly higher following reminders of death. In a follow-up study with the same participants 2 years later, Abdollahi et al. found that those who reported high levels of dissociation a month after the quake reported more severe PTSD symptoms, and as in the first study, did not engage in increased worldview defenses (i.e., support for a stricter dress code; negativity toward foreign aid) following MS, thereby demonstrating anomalous anxiety-buffer functioning; 2 years posttrauma. This lack of worldview defense partially mediated the relationship between dissociation in the first study and PTSD symptoms in the second.

In a replication and extension of these results, Kesebir, Luszczynska, Pyszczynski, and Benight (2011) collected data from female survivors of domestic violence in Poland in order to investigate the role that coping self-efficacy (CSE; Benight & Bandura, 2004)—the perceived ability to manage trauma sequelae—may play in anxiety-buffer functioning. As a reliable predictor of longitudinal PTSD symptom severity (Luszczynska, Benight, & Cieslak, 2009), CSE may be thought of conceptually as the antithesis of dissociation. That is, individuals with high levels of CSE have faith in their abilities to manage the aftermath of a traumatic event; conversely, those with low CSE have little confidence in their ability to handle such matters, thus increasing the likelihood that they might dissociate as a means of psychological protection. Indeed, the authors found PTSD symptom severity, high levels of peritraumatic dissociation, and low CSE to all moderate worldview defense responses to death reminders, in that individuals in each of these cases demonstrated more lenient judgments of moral transgressors than individuals without PTSD, low levels of dissociation, or high CSE. Further, each contributed unique variance in moderating the impact of MS on worldview defense.

I'VE GOT 99 PROBLEMS AND A MALFUNCTIONING ANXIETY-BUFFER IS THE ROOT OF THEM ALL

Throughout this chapter, we have established that problems related to the proper functioning of cultural worldviews, self-esteem, and close interpersonal relationships leave people exposed to anxiety produced by the dilemma of death. Collapse in the functionality of these mechanisms can deteriorate

our sense of safety and trust in the world and our close interpersonal relationships, effectively thwarting our ability to make meaning and satiate our needs for belonging (Baumeister & Leary, 1995), and dissolving our pathway to self-esteem. This can result in social isolation, negative self-focus/self-views, and even death focalization (e.g., phobias, compulsions; creatureliness and disgust—see Chapter 9, this volume), and of course, multiple forms of psychopathology.

Our TMT-based analysis emphasizes the role of ineffective anxiety-bufferfunctioning in the manifestation of attachment, anxiety, mood, and personality disorders, and even suicide. We also believe that this approach has potential utility in understanding other issues (e.g., substance abuse disorders) and emerging constructs such as moral injury. The construct of moral injury (Litz et al., 2009) evolved from clinical research and practice with veteran populations, and is posited to occur following morally egregious events that challenge deeply held moral values and beliefs. Such events may include directly perpetrating (e.g., killing another human being), being victim of (e.g., betrayal by a commanding officer) or witnessing (e.g., aftermath of battle) acts that challenge one's view of the world as a safe and benevolent place, and as ourselves and others as good and just people. Symptoms purported to signal moral injury include overwhelming self-conscious moral emotions (e.g., shame, guilt), negative self-appraisals and low self-worth (e.g., Farnsworth, Drescher, Nieuwsma, Walser, & Currier, 2014), spiritual struggles and difficulty with meaning-making (e.g., Currier, Holland, & Drescher, 2015; Currier, Holland, & Malott, 2014), demoralization, self-sabotaging in relationships, PTSD symptoms, and even self-harm behaviors (e.g., Maguen & Litz, 2012). Consistent with ABDT, morally injurious events represent a disruption to core assumptions of worldviews and meaning, as well as instability in interpersonal relationships (e.g., betrayal) and self-esteem (e.g., shame resulting from perpetration), and presents an illuminating illustration of negative psychological outcomes connected to the failures in anxiety-buffer mechanisms. Perpetration of violence that conflicts with one's moral standards certainly poses a severe threat to the self and one's ability to gain self-esteem through cultural worldview-related behavioral striving. Applicably, research has found self-discrepancies concerning important behavioral standards and personal conduct to result in anxiety (e.g., Higgins, 1987), depression (e.g., Pyszczynski & Greenberg, 1987), and greater retrieval of trauma-focused memories following positive cues for people with PTSD (Sutherland & Bryant, 2008).

CONCLUSION

The message is clear: a weak or disrupted anxiety-buffer appears to be related to a wide array of mental health issues and should be viewed as a transdiagnostic vulnerability factor for psychopathology. Certainly, this

chapter was not an exhaustive account all of the potential connections between problems with self-esteem, cultural worldviews and meaning, and close interpersonal relationships as they relate to psychopathology; however, we have presented a wide array of supportive connections from childhood development through adulthood, including attachment, personality, and trauma-related disorders, that link back to issues involving central components of the anxiety-buffer. Therefore, we posit that weak or disrupted anxiety-buffer functioning is a transdiagnostic vulnerability factor underlying myriad mental health issues. Those who have failed to develop effective anxiety-buffers due to problems in the early life struggle to manage anxiety, leaving them vulnerable to things, such as developing maladaptive personality traits or depressive symptoms. Those whose anxiety-buffering systems are disrupted by later traumatic life events must cope with the sudden collapse of this system. Although this often results in the development of PTSD, it may also lead to other mental health issues, such as moral injury (Litz et al., 2009) or even suicide. Taken together, the research on these issues provides affirmation of the central tenets of TMT and ABDT and their expansion to include developmental impediments that lead to poor anxiety-buffer functioning, thus providing a blueprint for understanding a variety of psychopathology.

While we did not address genetic or neurobiological predispositions and the role they play in psychopathology (e.g., Koenen et al., 2014), we certainly agree that such predispositions are part of the etiological processes leading to problems in anxiety-buffer functioning. For example, reduced hippocampal volume is observed in individuals with PTSD and has been identified as related to problems with memory encoding and retrieval (Elzinga & Bremner, 2002). However, whether reduced hippocampal volume is an antecedent or an outcome of PTSD (Gilbertson et al., 2006), its impact on memory makes creating a coherent narrative of a traumatic event difficult; such deficits can alter individuals' perceptions of the world, themselves, and others, and how they produce subsequent meaning narratives, thereby undercutting the optimal functionality of the anxiety-buffer and leaving people at risk for psychological dysfunction.

We also surmise that while weak or ineffective anxiety-buffer functioning is a vulnerability factor, a strong anxiety-buffering system can be viewed as a resiliency factor. Those with secure attachments, high self-esteem, and stable worldviews with strong meaning-making capabilities have been found to fair better in psychological and interpersonal functioning than those on the opposite end of those criteria (e.g., Arndt, Routledge, Cox, & Goldenberg, 2005). This highlights the enormous potential for future research into the idea that restoring the effectiveness of meaning, self-esteem, and interpersonal relationships can serve to ameliorate a host of diverse psychological problems.

Thinking of ineffective anxiety-buffering as a transdiagnostic vulnerability factors helps explain the high rates of comorbidity among emotional disorders

(Andrews, 1996; Brown et al., 2001). It also suggests that there are unifying factors representing the commonalities in the latent structure and/or etiological pathways of many mental health issues. We posit that dysfunctional anxiety-buffer mechanisms should be considered as synergistic generalized susceptibilities contributing to such commonalities, and that targeted interventions to address strengthening these mechanisms across the lifespan would be of great value.

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Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

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Chapter 19

The Cycle of Intergroup Conflict: Terror Management in the Face of Terrorism and War

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Throughout history, conflicts between groups have been part of human existence. Even though there has been a worldwide decrease in wars and conflicts on a macro-level, people have never been so regularly confronted with media reports of unimaginable numbers of deaths due to wars, conflicts, or terrorism as they are in the present day. While writing this chapter, we repeatedly saw news of armed conflicts such as the civil wars in Syria and Libya, the war against the Taliban in Afghanistan or the Islamic State (IS) in Iraq, or tensions in the East and South China Seas (Council on Foreign Relations, 2017). In recent years, terrorist attacks have taken place all over Europe, many of them motivated by radical Islamists: the truck attack in Berlin (Germany), the Westminster attack, the Manchester Arena bombing, the London Bridge attack, and the attack in Barcelona (Spain), to name just the biggest incidents (Islamic terrorism in Europe, 2017).

In their most recent report on terrorism in the European Union (EU), Europol confirmed that the number of attacks, as well as the number of arrests of suspects, has risen steadily in recent years (Europol, 2016; Nesser, 2014). Acts of terrorism performed or encouraged by the IS increase anxiety in the Western world: While thousands of people from war-torn regions seek refuge, many Europeans fear the arrival of immigrants in Europe, suspecting the IS has been using the influx of refugees to transfer personnel to Europe (Nesser, Stenersen, & Oftedal, 2016). In addition, Muslim immigrants can be radicalized in Western countries (Lyons-Padilla, Gelfand, Mirahmadi, Farooq, & Van Egmond, 2015). Thus, the fear of terrorism is at an all-time high.

This fear may be fueled by media reports on fatalities, explosions, armed fights, and terrorist plots that have been foiled at the last minute. Such

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reports bring the reminder of death directly into people's homes. News stories on terrorism and war confront people with the cruel realization that they are mortal and that their lives could end at any moment. The fear of the expansion of terrorism in the Western world and the steady influx of refugees from Middle-Eastern countries seem bound to lead exactly to what has been happening in many countries: increased fear of Islamic migrants and the danger of terrorist attacks many associate with them.

In numerous studies, especially within the scope of terror management theory (TMT; Greenberg, Solomon, & Pyszczynski, 1997; Pyszczynski, Solomon, & Greenberg, 2003), it has been found that reminding people of their own mortality makes them more defensive and less tolerant toward individuals who are not members of their own group; it also makes people more aggressive toward dissimilar others and increases support for military actions in intergroup conflicts (for a review, see Jonas & Fritsche, 2013; Pyszczynski, Abdollahi, Greenberg, & Solomon, 2006; Taubman-Ben-Ari & Findler, 2006; Yen & Lin, 2012). TMT sees these reactions as the result of the struggle to cope with the anxiety aroused by the realization of one's mortality. According to TMT, humans cope with this realization by bolstering symbolic, immortal aspects of their selves—i.e., their cultural and religious values and worldviews. Thus, the personal self is affirmed with death-transcending aspects of the (cultural) self, providing a sense of symbolic immortality. This way, people's focus shifts from a personal to a social and cultural one.

The recent support for right-wing and ultra-conservative parties and politicians can be regarded from this perspective: All over Europe, support for major political parties from the center or moderate wings is steadily declining in polls, while the more extreme parties have gained support. In Austria, for instance, where this chapter was written, the center-right ÖVP party won the parliamentary election and formed a coalition with the right-wing populist FPÖ party. Germany has also registered increasing support for the right-wing *Alternative für Deutschland* [Alternative for Germany] party, which finished third in the parliamentary elections (Bundeswahlleiter, 2017). In Great Britain, people voted to leave the EU in hopes of reducing the immigration of Islamic refugees (among other reasons); and the people of the United States elected a populist, authoritarian, right-wing president who promised to build a border wall to prevent illegal immigration from Mexico, depicted immigrants as rapists and drug dealers, and tried to prevent Muslims from entering the country (Lee, 2015). These insights into current political events suggest that people turn to abstract ideological convictions as a means of coping with perceived threat. They seem to favor more extreme political positions and tend to simplify their representations of complex situations when confronted with threat. The psychological processes underlying these changes are of special interest these days.

In this chapter, we discuss findings from years of terror management research on the effects of mortality salience and how proximal and distal defenses (see Chapter 2, this volume) in response to it have consequences for the development of conflict in social interactions. We present an interaction cycle that involves the perception of threatening situations that engage motivational-affective states, motivated cognition, and motivated behavior that might explain the escalation of interpersonal and intergroup conflict. We focus mainly on the context of armed conflicts, terrorism angst, and the refugee situation in Central Europe. We accumulate evidence for mortality salience and terrorism threat effects on the different stages of the proposed model; furthermore, we propose interventions and points at which we see the possibility of breaking the cycle of conflict.

FROM MORTALITY SALIENCE TO RADICALIZATION—A TERROR MANAGEMENT PERSPECTIVE

The main idea behind TMT is that humans alone of all animals experience the conflict between the basic instinct to stay alive and the unique understanding that life is finite and that one must die someday. This realization has the potential to lead individuals to feel a constant anxiety about ceasing to exist, i.e., terror (Greenberg, Pyszczynski, & Solomon, 1986; Greenberg et al., 1990). TMT posits that dealing with the fear of annihilation increases the importance of a cultural *anxiety buffer* consisting of *cultural worldviews*—a construction of the world that provides structure, meaning, and order and is shared among individuals in a group (see Burke, Martens, & Faucher, 2010)—and *self-esteem*—the conviction that one fulfills the expectations and standards suggested by the cultural values (Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004). Feeling securely attached to a meaningful group has been suggested as a third component of security maintenance after mortality threats (Mikulincer, Florian, & Hirschberger, 2003). Empirical research indeed has shown that following death reminders, people see themselves more as members of a meaningful collective, cling to its values, and are more disposed to defend themselves (Chapter 1, this volume; Burke et al., 2010); they strive to protect their self-esteem (Pyszczynski, Greenberg, Solomon, et al., 2004); and they are more committed to romantic relationships (Florian, Mikulincer, & Hirschberger, 2002). These reactions have been termed distal defenses and need to be differentiated from more proximal reactions in response to threat.

Proximal and Distal Defenses—A Dual-Process Model

Dealing with the terror elicited by mortality threats has been assumed to be a process consisting of two stages: The dual-process model of terror management (Chapter 2, this volume; Pyszczynski, Greenberg, & Solomon, 1999)

postulates a sequential process of immediate proximal and delayed distal defenses following the experience of existential threats. Directly following the threat, proximal defense strategies are activated in an attempt either to distract oneself in order to remove the threat from conscious awareness or to soothe oneself by interpreting the threat as not immediate (Pyszczynski et al., 1999; Sullivan & Greenberg, 2008). These strategies serve to defuse the perceived threat on a conscious level. However, successful proximal suppression of the threat does not eliminate its effects; it continues working on a subconscious level and, after a delay, leads to distal defense mechanisms: increased readiness to defend one's cultural worldview and to strive for self-esteem. In this way, TMT research has proven a valuable theory in explaining radicalization and conflict escalation (e.g., Pyszczynski et al., 2006; Pyszczynski, Rothschild, & Abdollahi, 2008).

A Terror Management Model of Escalation of Violent Intergroup Conflict

Building on TMT findings, Jonas and Fritsche (2013) proposed a cycle model to explain a vicious cycle consisting of the perception of an existential threat, the defense of social in-groups and cultural worldviews, intolerance toward different others and derogation of out-groups, and hostile behavior in social conflict. In this chapter, we explore findings from recent terror management research from the perspective of this model and expand on three of its elements: First, we incorporate recent neuropsychological findings into our understanding of threat-related intergroup dynamics to illuminate the motivational dynamics arising from existential threat. Second, we discuss the consequences of these dynamics not only for the behavior of the respective person confronted with the threat but also with regard to the recipients of this behavior, i.e., members of the out-group. This perspective makes it necessary to—third—broaden the analysis of conflict escalation from a focus on mortality salience to additional existential threats (such as isolation, loss of control, identity threats) out-group members face.

The Cycle of Escalation—Affect, Cognition, and Behavior

Recent history has shown that the current sociopolitical circumstances, terrorism angst, and omnipresent mortality cues can divide societies into groups defined by, say, political stance, ethnicity, or religion. This boosts the escalation of intergroup conflicts, as the current situation in France illustrates: The number of terrorist attacks in France has risen steadily in recent years (List of terrorist incidents in France, 2017). In consequence, the fear of terrorism has also increased—similar to the situation in most of Europe, where the Eurobarometer (2017) showed that among EU citizens, terrorism and immigration have become the EU's most important issues. In turn, there has been

an increased number of hate crimes against out-group members. For example, following the Islamist terror attack on the satirical magazine *Charlie Hebdo* in Paris in January 2015, France counted 128 hate crimes against Muslims within a span of 2 weeks, almost the same number that had been recorded in the whole of 2014 (cf Cohu, Maisonneuve, & Testé, 2016).

To better understand the dynamic between threat and intergroup conflict and to illustrate our proposed cycle model of intergroup conflict, we employ the example of fear of terrorist attacks and its effect on in-group members' attitudes toward refugees and asylum seekers (Fig. 19.1). Media reports of terrorism and military conflicts increase the salience of mortality (Step 1), resulting in a motivational-affective state (Step 2) of unpleasant arousal and anxiety described by TMT as existential anxiety. To leave this unpleasant state, people engage in motivated cognition, i.e., they seek information that provides structure and security about themselves or the group to which they belong (Step 3). By derogating or stereotyping out-groups, one can bolster one's worldview and self-esteem as part of a meaningful, entitative cultural group. Often, this motivated cognition is defined by rigid thinking, often with a harsh black-or-white mentality and a "with us or against us" rhetoric. These cognitions catalyze motivated behavior (Step 4), for instance, discriminative behavior or aggression against out-group members in social

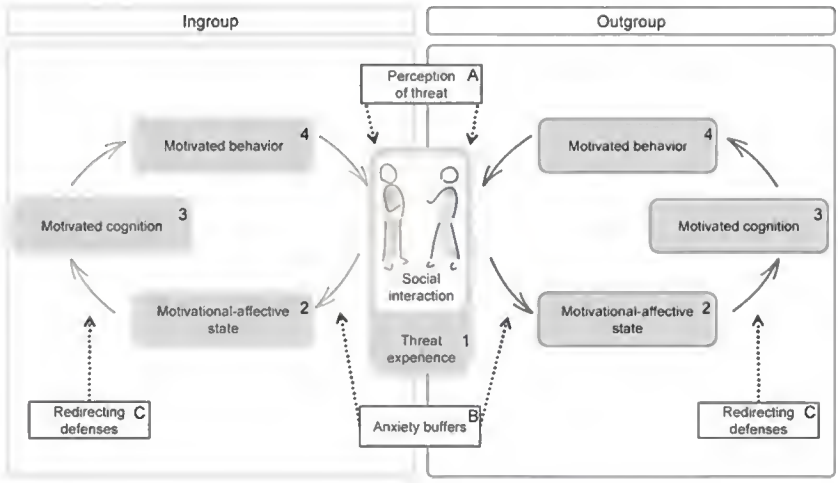


FIGURE 19.1 The cycle model of intergroup conflict. From the experience of a threat (Step 1) arises a motivational-affective state (Step 2). Motivated cognitions are employed to leave that state, worldview defenses are engaged (Step 3), fueling active, approach-oriented behavior (Step 4). Behavior in the interaction (face to face or through media) reiterates the loop on the opposite side. The cycle can be influenced by interventions regarding the perception of threat or its controllability (Path A), by providing alternative anxiety buffers (Path B), or by redirecting defenses via salient norms and in-group recategorization (Path C). *Illustration with permission by Vicky König.*

interactions. This cycle of social interaction has been described in the *Loop2Loop* model of social interaction (Jonas, 2015; Jonas & Bierhoff, 2017; Jonas & Mühlberger, 2017). To better understand how defensive behavior in response to threats such as mortality salience influences social interactions, we first concentrate on the perception of threat and then distinguish between responses on the motivational-affective, cognitive, and behavioral level.

Stages of the Cycle Model of Intergroup Conflict From the In-Group Perspective

Step 1—Perception of threat. In the most recent Eurobarometer survey conducted in the EU member states, 38% of surveyed participants listed immigration and 44% listed terrorism among the EU's two most important issues (Eurobarometer, 2017). In January 2017, 1005 interviewed German citizens named refugees/immigration (40%) and interior security/terror threat (11%) as the most important issues the government should address. Most of them reported worrying about increasing criminality (62%) and Islam gaining too much influence in Germany (55%) with the arrival of refugees (Infratest dimap, 2017). These numbers impressively illustrate the state of worry and latent threat many Europeans find themselves in.

Step 2—Motivational-affective state. The perception of threat causes a variety of reactions associated with passive avoidance of the threat, most prominently behavioral inhibition, anxious arousal, and attentional vigilance. Proximal responses can be adaptive because they allow individuals to avoid immediate harm. To achieve this, people often stop ongoing goal-oriented behavior and pursue other, less obstructed goals, or they try to find solutions to resolve the threat. Inhibition is hypothesized to underlie the proximal defense mechanisms described in the dual-process approach, by causing people to avoid threatening cognitions, inhibit behaviors that put themselves at risk, and look out for motivationally relevant new information.

The wealth of recent neuropsychological findings on these proximal reactions emphasizes how strongly the motivational forces of threat act on human cognitions and behavior (Chapter 16, this volume; Jonas et al., 2014; Quirin & Klackl, 2016). In turn, distal worldview defense is approach oriented and a vehicle for motivational reorientation to resolve the state of inhibition. Thus, it has been proposed that a threat-avoidance system—the behavioral inhibition system (BIS; Gray & McNaughton, 2000; McNaughton & Corr, 2004)—mediates the process from threat to approach (Jonas et al., 2014). In this section, we briefly expand on the different symptoms of this state and related empirical evidence.

Behavioral inhibition. Threat has been shown to lead to immediate inhibition of ongoing approach motivation and behavior: Reading a death-related poem, for example, immediately increased participants' right-hemispheric

frontal asymmetry, indicating inhibition of approach motivation, which mediated subsequent cultural closed-mindedness (Agroskin, Jonas, Klackl, & Prentice, 2016).

Anxious arousal. TMT posits that the effects of mortality salience are not driven by a state of anxiety, but by the *potential* to experience anxiety, resulting in no reliable findings of self-reported increases in negative affect to mortality primes. Greenberg et al. (2003) showed that an anxiety-reducing placebo eliminated worldview defense reactions to mortality salience. Yet, the argument against this "affect-free claim" has been made that appropriate and sensitive measures may render evidence for affective responses to mortality threats (Lambert et al., 2014).

Circumventing the proposed proximal suppression of death awareness, mortality salience increased retrospective reports of BIS-related affect (e.g., anxious, nervous) compared to a neutral control condition (Agroskin et al., 2016; Study 3). Implicit measures may provide another method to find changes in affect. For instance, individuals high in action orientation showed more implicit negative affect following mortality salience than in a non-threatening control condition (Lüdecke & Baumann, 2015), and implicit measures of security-related stress increased when individuals viewed media reports of terrorism (Peleg & Mass-Friedman, 2013).

Vigilance. In various electrophysiological (EEG) experiments, death-related words increased the amplitude of the late positive potential component of the event-related potential within the first second of presentation, indicating allocation of attention toward the threatening words (Klackl, Jonas, & Fritsche, 2017; Study 2; Klackl, Jonas, & Kronbichler, 2012). Results from functional neuroimaging add to this picture: Compared to dental pain sentences, mortality-related sentences were found to elicit stronger activation in the dorsal anterior cingulate cortex and the amygdala, brain regions frequently associated with the detection and processing of emotionally and motivationally salient stimuli (Klackl et al., 2017; Quirin et al., 2012).

Avoidance motivation. While vigilance to motivationally salient stimuli is heightened in this proximal state, TMT research suggests that mortality threats lead to an immediate suppression and avoidance of death-related thoughts and self-focus: For instance, participants spent less time writing about their own deaths in rooms that increased self-awareness by containing mirrors (Arndt, Greenberg, Simon, Pyszczynski, & Solomon, 1998), and participants avoided even pleasurable physical sensations following mortality primes (Goldenberg et al., 2006). This claim is supported by neuropsychological findings of mortality salience-induced hypoactivation of the insula, a brain region related to self-awareness (Han, Qin, & Ma, 2010; Klackl et al., 2017; Klackl, Jonas, & Kronbichler, 2013).

Remaining in this inhibited anxious state is dysfunctional. Therefore, we can hypothesize that people are highly motivated to find ways to activate the

behavioral approach system (BAS; Gray & McNaughton, 2000) and regain agency by activating approach-related behaviors. This helps people downregulate the BIS and leave the state of aversive arousal (Corr, 2004; McGregor, Prentice, & Nash, 2012; Nash, Inzlicht, & McGregor, 2012).

Step 3—Motivated cognition. Cognitive activities can help people reduce the aversive state of anxiety and related feelings of vulnerability and help them regain a sense of structure, agency, and control. This process is susceptible to bias—individuals can choose whatever cognition provides simple solutions and promises instant relief. Previous research has found plenty of evidence for mortality salience effects on rigidity in thinking and information seeking, stereotyping, in-group favoritism, and hardening of one's religious and political convictions. They all subserve the same goal, i.e., to provide relief and regain agency. Since in-groups and their values can be powerful, entitative, and readily available vehicles for this process, the switch to a more collective self-identification can take place here. While this may be helpful for the individual, this hardening of beliefs, intergroup attitudes, and cognitions can lead to simplifications, generalizations, and ultimately radicalization and escalation of conflicts.

Rigid thinking and information seeking. One of the motivated cognitions following threat is a tendency to prefer information consistent with one's prior convictions over contradictory information, thus validating current belief systems and schemata. Mortality salience has been shown to increase rigidity in confirmatory information seeking (Jonas, Greenberg, & Frey, 2003), social-cognitive structuring (Landau, Johns, et al., 2004), simplistic and generalized social categorization of out-group members (Kimhi, Canetti-Nisim, & Hirschberger, 2009), and increased dogmatic certainty of beliefs (Vail, Arndt, Motyl, & Pyszczynski, 2012). Reminding participants of their mortality has been shown to increase Christians' belief in Jesus but lower their belief in Allah, thus bolstering their own beliefs while distancing themselves from rival beliefs (Vail, Arndt, & Abdollahi, 2012). Landau, Rothschild, and Sullivan (2011) generalized the effects of threats on cognition as *fetishism*, or "investment of meaning into any narrow aspect of life" (p. 134). This can mean reducing complex and chaotic issues to a "black-or-white" matter that provides clear prescriptions for behavior and thus a sense of control and significance.

Political attitudes. In terms of political orientation, experiences of mortality have been shown to cause a shift toward more extremist positions: In experimental studies, mortality salience increased conservatism in conservative individuals (Castano et al., 2011) and beliefs in a dangerous world and disliking of immigrants in French and US participants high in right-wing authoritarianism (Weise, Arciszewski, Verlhiac, Pyszczynski, & Greenberg, 2012). However, the effects were reversed for liberal and low-authoritarian individuals, who responded to mortality threats by bolstering their moral foundations, such as fairness virtues (Bassett, Van Tongeren,

Green, Sonntag, & Kilpatrick, 2015). In a longitudinal study, conservative individuals who had suffered the loss of a loved one increased in conservatism, whereas initially liberal participants expressed increased liberalism after losing a closely related person (Chatard, Arndt, & Pyszczynski, 2010).

Yet, other studies found a general trend toward conservatism and charismatic leaders following mortality salience: Cohen, Ogilvie, Solomon, Greenberg, and Pyszczynski (2005) reported that in the 2004 presidential election in the United States, a mortality threat made salient through a video of Osama bin Laden released shortly before election day marked a turning point in the election in favor of the Republican candidate G.W. Bush. Subsequent laboratory studies showed that following mortality salience, but not a neutral prime, Bush received more support than the Democratic candidate Kerry (Cohen et al., 2005; Landau, Solomon, et al., 2004). Likewise, during the 2016 presidential election, mortality salience (vs an aversive control prime) increased support for the Republican presidential candidate Donald Trump, but not the Democratic candidate Hillary Clinton (Cohen, Solomon, & Kaplin, 2017).

A meta-analysis tried to clarify whether mortality salience leads to a shift to conservatism or a stronger identification with previously held worldviews. Here, the authors found evidence for both hypotheses: Both theories yielded significant effect sizes but they did not differ statistically from each other (Burke, Kosloff, & Landau, 2013). The results suggest that following mortality threats, individuals orient themselves by salient norms, values, stereotypes, group identities, and cognitions to regain psychological security—the values that promise the most security and stability in a given situation are the most sensible ones to cling to.

Stereotyping. Another aspect of motivated cognition lending structure to the threatened individual is the forming or hardening of stereotypes, i.e., the overgeneralization of beliefs about members of a certain group. Participants presented with mortality reminders have been shown to attribute more stereotypical, negative traits to out-groups (Castano, 2004) and to display more prejudiced attitudes after receiving news about terrorism (Das, Bushman, Bezemer, Kerkhof, & Vermeulen, 2009). This effect was stronger when judging dissimilar (vs similar) out-group members; i.e., in US participants, prejudices were stronger toward undocumented immigrants from Mexico than for immigrants from Canada (Bassett & Connelly, 2011). The inclination to engage in stereotyping following mortality salience can even lead to a preference for out-group members behaving in a stereotype-consistent (vs inconsistent) way (Schimel et al., 1999), even if stereotype-inconsistent individuals offer peaceful conflict solutions (Fritsche, Koranyi, Beyer, Jonas, & Fleischmann, 2009). This illustrates the need to regain a sense of structure and control, even if this means disregarding constructive conflict solution strategies.

In-group favoritism and out-group derogation. Aside from categorizing others as out-group members, individuals often increase their own identification with their in-group by favoring in-groups (Hewstone, Rubin, & Willis, 2002), distancing from out-groups (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), or even hating out-group members (Brewer, 1999). Mortality salience and terrorism primes catalyze this effect: Americans reacted to the 9/11 terrorist attacks with intolerance, discrimination, and prejudice against out-groups, even if they were only symbolically related to the attacks (Morgan, Wisneski, & Skitka, 2011). Experimental manipulations of mortality salience led individuals to assign more blame to (foreign) out-group versus in-group car manufacturers for a car accident (Nelson, Moore, Olivetti, & Scott, 1997) and to rate out-group defendants (of another ethnicity) more likely to be guilty in a fictitious murder trial (Leippe, Bergold, & Eisenstadt, 2017). The manipulations also increased their acceptance of in-group members' racist ideologies (Greenberg, Schimel, Martens, Solomon, & Pyszczynski, 2001).

In summary, mortality reminders lead to a wide variety of cognitions that individuals may employ to ease the aversiveness of the aroused motivational-affective state directly following a threat. These cognitions restore a sense of control, agency, and structure and serve as catalysts for motivated behavior that restores goal orientation. Unfortunately, motivated cognitions are often heavily biased and, while serving the in-group, lead to further distance from the out-group and may legitimize antisocial or aggressive behavior.

Step 4—Motivated behavior. In the next step, motivated cognitions fuel motivated behavior. Little evidence exists for the mediational influence of motivated cognition on behavior in the context of TMT, but the connection between mortality salience and motivated behavior has been shown in many instances.

Interpersonal aggression. A general effect of mortality salience found in TMT research is an increased disposition to behave aggressively toward others: For instance, following experimental mortality salience, male individuals displayed increased dominance behavior in the subsequent week: They reported using more aggressive and intimidating tactics against others, being more forceful, and trying to gain control over others (Belmi & Pfeffer, 2016). In another study, mortality salience increased the amount of hot sauce participants allocated to others, even though they were aware that the recipient did not like spicy food (McGregor et al., 1998); this effect was even stronger when the sauce was allocated to out-group members (McPherson & Joireman, 2009).

Action intentions against worldview violators. When confronted with mortality primes, individuals tend to become more defensive of their own in-group; thus, perceiving people and groups as potential threats to one's worldview increases the readiness to exert force against those violators. Following

terrorism salience, German participants punished criminals (car thieves or rapists) more harshly than without a threat prime (Fischer, Greitemeyer, Kastenmüller, Frey, & Oßwald, 2007). Mortality salience made US participants willing to treat Saudi terrorism suspects (enemy out-group) more harshly than US (in-group) and Bulgarian (nonenemy out-group) suspects (Kugler & Cooper, 2010).

Violent conflict solution. Apart from promoting interindividual action against perceived worldview violators, mortality threats have been shown to increase the readiness to solve intergroup conflicts with more rigorous measures: Following mortality salience, US participants were more supportive of using nuclear weapons to fight terrorism (Pyszczynski, Abdollahi, Greenberg, et al., 2006), and Israeli participants showed more support for a preemptive use of nuclear weapons against Iran (Hirschberger & Ein-Dor, 2006). Participants were willing to send more troops to an imaginary battle, even if previous attacks had failed, after a mortality compared to a dental pain prime (Yen & Lin, 2012). Under mortality salience, military interventions are still supported even when they are presented as ineffective, as long as they provide a feeling of justice and retaliation (Hirschberger, Pyszczynski, & Ein-dor, 2010, 2015; Hirschberger et al., 2016). In real-life combat situations, collaboration in the peace-keeping mission in Kabul between German and Dutch soldiers worsened in the presence of mortality threats (Dechesne, van Den Berg, & Soeters, 2007).

We have suggested that the disposition to act aggressively toward another group stems from the perception of a threat that elicits a motivational-affective state and, subsequently, motivated cognition that justifies aggression. Considering the current political situation in many countries, demagogues can abuse the circumstances by perpetuating fear and offering oversimplified solutions to complex problems. This is exactly what threatened individuals in an aroused motivational-affective state prefer: Some adhere to simplistic narratives, such as Donald Trump's prediction of rapist foreigners taking over the United States (Lee, 2015) or German citizens' worry that adolescent immigrants are child soldiers (Die Welt, 2016).

These reactions do not serve to gather objective information, as many such arguments and stories can be easily refuted. Rather these reactions can help people to regain agency, i.e., to pursue the feeling of being strong and agentic which in turn enables individuals to engage in a behavioral approach (Jonas et al., 2014). Indeed, ethnocentrism has been shown to mediate the shift from the aforementioned proximal state of BIS activation to regain agency and engage in approach-related behaviors mediated by the BAS (Agroskin et al., 2016; Amodio, Shah, Sigelman, Brazy, & Harmon-Jones, 2004; Corr, 2004). However, this may cause a problem for intergroup relations as it often legitimizes aggressive stances and behavior against perceived worldview violators or simply out-group members.

ESCALATING AND DE-ESCALATING THE CYCLE OF CONFLICT

While the cycle of intergroup conflict paints a dire picture of escalating intergroup conflicts in the face of threat, terror management mechanisms provide some hope that under certain circumstances, individuals can be resilient against existential threat and do not necessarily respond to reminders of mortality with hostility and in-group bias. As we show in this section, our cycle model of intergroup conflict integrates these positive pathways by providing evidence that confrontation with mortality cues is not always perceived as a threat, for instance, when individuals have a feeling of control (Fig. 19.1, Path A). Furthermore, situations or personality traits that provide means of symbolic death transcendence can act as anxiety buffers by boosting self-esteem or reminding people of secure attachment to the in-group (Path B).

We have argued that people are subject to many sources of mortality reminders. A simple and straightforward way people deal with the terror arising from these threats is to bolster their worldviews to regain cognitive clarity and a feeling of value and agency, yet often at a cost to out-groups that become the target of derogation, discrimination, and aggression.

However, mortality salience does not necessarily lead to antisocial behavior and escalation (Jonas & Fritsche, 2013; Niesta, Fritsche, & Jonas, 2008). We proceed to present empirical evidence and theoretical considerations that offer viable ways to decelerate and interrupt the cycle of intergroup conflict or redirect defensive responses to threats toward more prosocial outcomes. These can be applied at the various stages of our model.

Perception of Threat

The first step in escalation of conflict and radicalization is the perception of a situation as a threat. Thus, reducing the experience of threatening stimuli is a straightforward way to interrupt the vicious cycle. As we have seen, the threat of terrorism, war, and death is kept almost constantly salient by watching the news, reading papers, or using social media. In addition, using death reminders and presenting threats is a technique often used by politicians to increase support for extreme political or military measures (Landau, Solomon, et al., 2004). According to TMT, ceasing the deliberate employment of death reminders as a political strategy to exert influence on citizens would be a simple strategy to reduce conflict.

However, facing mortality reminders does not necessarily lead to an escalation of conflict: Having a feeling of control can reduce the negative outcomes of threats. Indeed, perception of control can reduce the need to restore control or bolster one's worldview; for instance, the effects of uncontrollable death on worldview defense disappeared when participants thought about self-determined death (Fritsche, Jonas, & Fankhänel, 2008).

Anxiety Buffers and Personality Traits Moderate Mortality Effects

Aside from situational circumstances, individual predispositions, attitudes, and personality traits have been shown to moderate the effects of mortality salience manipulation on defensive reactions. Activating the so-called anxiety buffers may help prevent the escalation of intergroup conflicts, as they provide a sense of existential security and reduce the potential to experience anxiety. In this section, we briefly introduce various important moderators of mortality salience effects.

Self-esteem. As we explained at the beginning of this chapter, mortality threats lead to striving toward self-esteem, i.e., a feeling of living up to the values and standards of one's cultural worldview. However, defensive reactions to threat can be modulated by experimental manipulations of self-esteem: For instance, positive personality feedback has been shown to decrease defensive reactions to mortality threats (Harmon-Jones et al., 1997; Study 1), as long as the domain of the self-esteem boost and the threat do not overlap (Arndt & Greenberg, 1999). Experimentally threatened self-esteem increased the accessibility of death thoughts (Hayes, Schimel, Faucher, & Williams, 2008). Further research investigated differences in trait self-esteem in reaction to existential threats. Overall, individuals low in self-esteem seem to be more vulnerable to feeling threatened and anxious in response to a threat: They tend to react with avoidance of self-related thoughts (Wisman, Heflick, & Goldenberg, 2015) and increased ethnocentrism (Agroskin & Jonas, 2013); they feel less satisfied with life, less vital and active, experience life as less meaningful, and feel less inclined to exert exploratory behavior (Routledge, Ostafin, et al., 2010).

However, individuals high in dispositional self-esteem may also show negative responses to threats: When confronted with a terrorism threat, high self-esteem participants reacted with increased willingness to make personal sacrifices for their home country, or even "die for England" (Juhl & Routledge, 2014; Study 1). High self-esteem participants primed with their own mortality showed increased motivation for military service in Israel (Taubman-Ben-Ari & Findler, 2006).

In summary, while low self-esteem seems to lead to more passive defensive reactions on a social level in response to threats, high self-esteem seems to predict more proactive and agentic defensive responses, indicating that individuals high in self-esteem are more inclined to prove their belongingness to a cultural worldview. These responses can be very detrimental for peaceful solutions to intergroup conflicts.

In-group embeddedness. As we discussed earlier, individuals often react to mortality threats with increased in-group identification and intergroup bias to gain a sense of symbolic, collective immortality. However, when people already feel securely embedded in a meaningful in-group, they should experience less need to bolster their in-group identity and thus be

less socially defensive. Indeed, individuals who had thought about their American in-group reacted with less death-thought accessibility to a mortality prime than individuals prompted to think about the British (Vaes, Heflick, & Goldenberg, 2010; Study 3). According to Jonas and Fritsche (2013), immersion in a cultural in-group can reduce cognitive and behavioral defensiveness if individuals feel well integrated in a group that is homogeneous and agentic (Fritsche et al., 2008), and this identity is not under attack.

Secure attachment. An anxiety buffer closely related to in-group embeddedness is affirmation of close relationships and secure attachment (Chapter 10, this volume). Following mortality threats, individuals often strive for close and intimate relationships; in turn, salience of a secure attachment to a romantic partner, intimate friend, or even one's parents can reduce defensiveness after mortality primes (Cox et al., 2008; for an overview, see Mikulincer, Florian, & Hirschberger, 2004). Priming of secure relationships led to less support of extreme military violence against terrorists in response to mortality salience (Weise et al., 2008). Thus, escalation of intergroup conflict could be reduced by reassuring individuals of their secure social relatedness.

Need for closure/structure. Another important personality trait is the need for cognitive closure, i.e., the preference for any kind of answer to an issue over ambiguity and (perceived) costly information processing (Webster & Kruglanski, 1994). While need for closure can be situationally manipulated, there is a trait component representing relatively stable interindividual differences that is related to negative-avoidance motivation (Corr, Hargreaves-Heap, Tsutsui, Russell, & Seger, 2013). High dispositional need for closure moderates the effect of mortality salience on BIS activation and on the association between BIS activation and ethnocentric attitudes (Agroskin et al., 2016) and leads to more in-group identification (e.g., with one's university) following mortality salience (Castano & Dechesne, 2005; Juhl & Routledge, 2010).

Similarly, a high trait need for structure—reflecting a preference for a clear, unambiguous, and orderly worldview—is associated with more worldview defense following mortality and terrorism threats (Routledge, Juhl, & Vess, 2010). On the other hand, a low need for structure seems to function as an anxiety buffer: Participants with a low need for structure responded to a terrorism threat with less nationalistic rigidity and less rigid attitudes toward a traditional holiday than high-need-for-structure participants (Routledge, Juhl, et al., 2010).

Worldview affirmation. Like in-group embeddedness, cultural worldviews and ideals tend to be affirmed by individuals in response to threats as they seek to defend themselves against existential anxiety. However, a worldview can provide this security only if it is secure, stable, and consistent itself. The assumption that affirming one's worldview would reduce the need to defend one's values in the face of threat was investigated by Schmeichel and

Martens (2005): They found that affirming worldview aspects important to participants reduced subsequent mortality salience-induced worldview defense more than when unimportant aspects were affirmed. Furthermore, affirmation of traditional aspects of Austrian culture made a sample of Austrian participants more willing to buy foreign products (Sullivan, Jonas, & Jodlbauer, 2011). Closely related to worldviews are religious belief systems, which can also buffer individuals against existential threats. Highly intrinsically religious people have been shown to be less affected by mortality threats after they have had the opportunity to affirm their religious worldview (Jonas & Fischer, 2006; for a review, see Flannelly, 2017).

To summarize our line of reasoning so far, we have presented evidence for anxiety buffers and personality traits that have shown to moderate worldview defense in reaction to mortality threats (Fig. 19.1, Paths A and B). However, there is a third way to influence whether a threat results in the escalation of conflict: In-group defense depends heavily on what kind of norm is salient in a specific situation. Thus, influencing the salience of certain norms should affect the norms people grasp at when under threat (Path C) and thereby re-route the defensive response.

Redirecting Worldview Defense

Norm-conforming behavior. When experiencing existential anxiety, individuals feel the need to defend their in-group and the values and norms it prescribes. However, culture comprises numerous different norms, many of them potentially fostering positive intergroup relations such as prosocial behavior, fairness, and tolerance. Importantly, coexisting norms can lead to different interpretations of what behavior conforms to the culture's values: In response to recent events, some Europeans strove to defend their Christian identities, fearing Islamization, but others actively helped refugees arriving in Europe with donations and volunteer work, in line with norms of tolerance and altruism.

The values individuals defend under threat depend on *personal norms*, i.e., internalized representations that define how one should act, for instance, with altruistic behavior, and *social norms* that prescribe what good in-group members would do, such as, in the earlier example, defending their Christian in-group's homogeneity. Which norms people cling to under threat depends mainly on the personal or social norms that are immediately available.

Personal norms. Some studies have investigated conservative norms such as right-wing authoritarianism and social dominance orientation as predictors of defenses following mortality threats. Both norms have been shown to predict higher support for the war on terror in the wake of 9/11 as well as for President George W. Bush and the US military engagement in Iraq (Goldenberg, Heflick, Vaes, Motyl, & Greenberg, 2009). Right-wing individuals—who also showed a higher need for closure than left-wing

participants—emphasized the ethnic and cultural otherness of aggressors and showed more support for repressive counterterrorism measures (Sensales, Areni, Boyatzi, Dal Secco, & Kruglanski, 2014). On the other hand, people low in right-wing authoritarianism responded to mortality salience with more positive evaluations of an immigrant and more interest in social interaction with him (Weise et al., 2012). Hence, the presence of liberal and prosocial personal norms seems to be a promising basis for lessening hostile responses to out-groups in situations of threat.

Injunctive and descriptive social norms. Salient social norms also play an important role in determining defensive responses following a threat. There are two kinds of social norms (cf Cialdini, Kallgren, & Reno, 1991): *injunctive norms* that describe how members of a group should behave based on moral convictions and *descriptive norms* that are inferred from the observation of other in-group members' actual behavior.

Situational activation of injunctive norms has been shown to have great influence on worldview-consistent behavior: When a positive evaluation of violence was made salient after mortality salience, individuals reacted with more aggressive attitudes toward an out-group; however, a pacifism prime led to a decrease of aggressive action intentions (Jonas et al., 2008), a fairness prime eliminated the lessening effect of mortality salience on donating to foreign charities (Jonas, Sullivan, & Greenberg, 2013), salience of the cultural value of egalitarianism reduced prejudices following a mortality prime (Gailliot, Stillman, Schmeichel, Maner, & Plant, 2008), and favorable behaviors were reciprocated more readily under mortality salience when a norm of reciprocity had been activated (Schindler, Reinhard, & Stahlberg, 2013). Thus, the prosocial or antisocial nature of defensive reactions seems to depend on which injunctive norms are salient and most prominent in the situation, allowing individuals to behave as good group members should. This underscores the importance of propagating prosocial injunctive norms, as when Angela Merkel insisted that "we can do it" during the refugee influx (Zeit Online, 2015) or when people post *refugees welcome* on social media.

Additionally, people can derive descriptive norms on a more concrete level from observing fellow group members' behavior. This can promote acting in accordance with peers to affiliate with the in-group (Castano & Dechesne, 2005). Thus, when identifying strongly with a group, observing its members acting in a hostile way or displaying hostile attitudes should lead to more hostile behavior in the individual, and vice versa. Indeed, priming participants with social consensus about violent conflict solutions increased their approval of violent actions following a mortality prime; however, the mortality salience effect was mitigated when there was a perceived consensus against violence (Abdollahi, Henthorn, & Pyszczynski, 2010). Furthermore, when there is no perception of a consensus within a group, in-group bias effects can also be reduced: Information about a lack of identification with the in-group (their university) led students to less in-group bias following

mortality salience (Giannakakis & Fritsche, 2011; Study 3); and perceived in-group pessimism about the in-group's future mitigated in-group bias after mortality salience (Jonas & Fritsche, 2012). In summary, antisocial and hostile behavior directed at out-groups can be reduced by the salience of prosocial norms within a society, or at least the demonstration that antisocial and hostile behavior is not a culturally shared norm.

In-group categorization. Apart from salient norms, in-group defense depends heavily on *who* is in the in-group. Take an English person judging a French individual: the French person can be seen as an out-group member, subsequently to be derogated or attacked, or as a fellow European, which would incorporate the French person into the in-group of Europeans. Indeed, English participants' intergroup bias against French people was reduced by manipulating their in-group definition to be Europeans instead of English (Giannakakis & Fritsche, 2011; Study 2). Salient in-group categories can also influence the values that need to be defended in reaction to a threat: After mortality salience, indigenous Australians defended individualist views when primed with their Australian identity but defended collectivist values when primed with their indigenous identity (Halloran & Kashima, 2004). Thinking about shared experiences and global consequences of threatening situations such as global warming can lead to peace support under mortality salience (Weise et al., 2012), and emphasizing common human characteristics instead of differences can reduce intergroup bias (Motyl et al., 2013). These findings illustrate that cultural self-identification can be flexible and can influence the worldviews to be defended.

In sum, these results illustrate that the effects of mortality and terrorism threats are malleable and do not necessarily lead to escalation of intergroup conflict. We have shown that the perception of threats and of their controllability can be influenced, and anxiety buffers can be bolstered to prevent the elicited in-group defensiveness. Furthermore, we have shown that personal and social norms, as well as the identification with an in-group, are dependent on the situational salience of norms and social categories, allowing for worldview defense to be diverted toward more prosocial outcomes.

CONSEQUENCES OF CONFLICT FOR THE OUT-GROUP AND THE DYNAMICS OF SOCIAL INTERACTIONS

So far, we have focused on the side of the in-group members in the cycle of conflict and their reactions in response to existential threat. However, these reactions are not the end point of our analyses. To understand escalating and de-escalating intergroup processes, it is also important to consider the impact of in-group members' motivated behaviors on out-group members. Because of threat, the behavior toward out-group members is often characterized by discrimination, social exclusion, or even physical violence. In situations of mortality salience, out-group members enter the "out-group cycle" of the

model not only with the experience of existential threat but also with the perception of being treated in this manner in social interaction (Fig. 19.1, right-hand side).

Step 1—Perception of Threat

We suggest that the later stages of our cycle model are analogous to what we have discussed for in-group members. However, when confronted with discrimination, social exclusion, and violence, out-group members are confronted with a variety of existential threats that go beyond or add to the picture of mortality salience. The field of experimental existential psychology (XXP) lists death, isolation, and threats to identity, freedom, and meaning (Koole, Greenberg, & Pyszczynski, 2006; Pyszczynski, Greenberg, & Koole, 2004) as the "Big 5" existential concerns. Although discussion of the detailed commonalities and differences among these threats is ongoing (and beyond the scope of this chapter), there is a substantial overlap of existential threats with TMT findings, which improves our understanding of the processes in the out-group cycle (cf Jonas et al., 2014). An existential threat in the context of XXP can be defined as the experience of "an attack on one's own symbolic structures of meaning and value" (Sullivan, Landau, & Kay, 2012, p. 738).

Having one's cultural values and worldview questioned by members of the host culture, by explicit or structural discrimination, social exclusion, or otherwise, impedes the function of worldview as an anxiety buffer and source of self-esteem (Motyl, Rothschild, & Pyszczynski, 2009). The confrontation with uncertainty concerning one's own personality or identity has been shown to lead to similar defensive reactions to those elicited by mortality threats (McGregor, 2006). Consequently, the mere presence of unfamiliar cultural rules can become a threat, for instance, a difference regarding gender roles that (male) immigrants need to cope with (Fiske, 2013). The dissimilarities between Western worldviews and behaviors linked to symbolic immortality in response to threats and Middle-Eastern faith in literal immortality are another example of conflicting worldviews (Solomon, Testoni, & Bianco, 2017).

Although the United Nations Refugee Agency introduced an international anti-xenophobic discrimination policy, Achiume (2014) described two distinguishable forms of xenophobic discrimination refugees and asylum seekers are often confronted with in their host countries: explicit prejudice-based discrimination comes from anti-foreigner prejudice. On the other hand, structural xenophobic discrimination arises from numerous interacting factors resulting in disadvantage, even in the absence of explicit prejudice. For instance, refugees are granted the right to education but need a birth certificate to enroll. If the certificate was destroyed during the journey to the host country and the asylum seekers cannot contact their governments, their rights

are compromised without explicit discrimination. Such structural unfairness brings along a socioeconomic marginalization, leaving refugees even more vulnerable to further discrimination. To conclude, minority groups and refugees face many existential concerns and threats in their host countries, any of which can elicit a dismal motivational-affective state.

Step 2—Motivational-Affective State

According to the *general process model of threat and defense* (Jonas et al., 2014), different existential threats elicit anxiety that is produced by the BIS. This inhibited, anxious state of BIS activation produces symptoms such as vigilance, anxious arousal, and passive avoidance motivation (Corr, DeYoung, & McNaughton, 2013).

One example that illustrates the dangerous effects of the current refugee situation is social exclusion. Many refugees face humiliating ostracism in their host countries: They feel unwelcome and that they are not a part of society. Ostracism has profound psychological influence—it has even been termed *social death* (Williams, 2007). It has been shown to elicit reactions very similar to the proximal BIS symptoms described earlier, such as distress, interruption of behavior, and vigilance, and distal reactions such as death-thought accessibility (Steele, Kidd, & Castano, 2015). Ostracism hurts even if the excluder is part of a despised out-group (Fayant, Muller, Hartgerink, & Lantian, 2014). Individuals low in self-esteem reacted to social rejection cues (vs neutral cues) with an increased physiological response, as indicated by the P2 component of event-related potentials in EEG recordings (Li, Zeigler-Hill, Luo, Yang, & Zhang, 2012). The importance of ostracism for the dynamics of intergroup conflict shows in how similar its effects are to those of mortality salience.

Refugees are often portrayed as a faceless mass of deindividualized people and are sometimes even denied human traits such as emotional warmth, civility, morality, or cognitive aptitude (Esses, Medianu, & Lawson, 2013; Esses, Veenvliet, Hodson, & Mihic, 2008; Haslam, 2006). Being treated as incompetent or uncivilized can result in feelings of guilt and humiliation and in an aversive state of self-awareness and self-blame; feeling objectified (or dehumanized) can lead to feelings of sadness and anger (Bastian & Haslam, 2011). Furthermore, threats to one's self-esteem lead to increased accessibility of death-related thoughts and are likely to elicit similar defensive reactions (Hayes et al., 2008).

This inhibited, anxious state is often accompanied by strong negative emotions: Radicalized individuals often report feelings of humiliation as members of a marginalized group. This humiliation can stem from feeling that one's worldview is inadequate, or from an unfair imbalance of power in society (Motyl et al., 2009; Stern, 2003). In summary, the confrontation with

existential threats combined with limited access to anxiety buffers can elicit a state of inhibition, anxiety, and BIS activation.

Step 3—Motivated Cognition

Experiencing threats in the interaction with the mainstream culture increases the need to reduce the arising existential anxiety and regain agency and structure. To do so, individuals can engage in motivated cognitions such as increasing affiliation with their own in-group or distancing themselves from "enemy" out-groups, creating a clear-cut construal of a situation with sharp distinctions between in-group and enemies, and setting the stage for subsequent behavior (Chapter 11, this volume; Castano & Dechesne, 2005).

This effect can be observed following mortality threats but also in situations where lack of control is perceived: Feelings of uncontrollability have been shown to elicit in-group bias (Greenaway, Louis, Hornsey, & Jones, 2014) and the need to restore group-based control (Fritsche et al., 2008). Participants confronted with uncontrollability of their environment attribute increased influence to enemies; enemies become a psychological focal point in an otherwise diffuse situation, thus lending structure and allowing action orientation (Sullivan, Landau, & Rothschild, 2010). Furthermore, threats to the homogeneity and agency of a group increased in-group support and defense after a threat to personal control (Fritsche et al., 2013).

This sharp definition and separation of in-groups and out-groups is often accompanied by increased affirmation of the in-group's values. According to Doosje, Loseman, and van den Bos (2013), a radicalization process is driven by personal uncertainty, the perception of injustice, and a threat to one's group. The adoption of radical beliefs promises straightforward relief from existential concerns: Radical beliefs are painted in black-and-white, suggesting superiority of believers over "unbelievers" and increasing the perceived distance and disconnectedness from nonmembers of the group and the perception of authorities as illegitimate. Thus, they promise exactly the anxiety-buffering functions marginalized individuals desperately seek in the absence of alternative buffers and provide clear injunctive and descriptive norms. When their group is threatened, people who identify highly with their cultural values have been shown to conform even more strongly to norms (Jetten, Postmes, & McAuliffe, 2002). Furthermore, intergroup threats can lead to intergroup biases, i.e., negative attitudes toward other groups and stereotyping (Riek, Mania, & Gaertner, 2006). Once individuals have gained a strong belief system, its affirmation works effectively again. Generally, affirmation of beliefs has shown to be a potent mechanism under threat: In a sample of Muslim participants, mortality salience increased their belief in Allah, but it also led them to deny their belief in God, Jesus, and Buddha (Vail et al., 2012). In a study conducted with Iranian participants, mortality reminders led to a more positive evaluation of an essay supporting

martyrdom and heightened the willingness of threatened individuals to join a promartyrdom cause (Pyszczynski, Abdollahi, Solomon, et al., 2006).

In extreme cases, marginalized individuals from minority groups adopt and identify with radical belief systems. McGregor, Hayes, and Prentice (2015) coined the term *aggressive religious radicalization* to describe how people "augment the feeling of power, status, or control" by "belittling, overpowering, or destroying" targets (p. 6). Religious values can serve as a foundation for this radicalization, since they can give meaning and structure, as discussed earlier. Individuals with identity-weak traits and high BIS sensitivity are especially prone to radicalization in circumstances of anxiogenic threats and when a group's value system affords an unfalsifiable narrative that justifies aggression. These affordances overlap greatly with the motivated cognitions of our cycle model, since they incorporate cognitive rigidity, biased information seeking, hardening of beliefs and attitudes, and legitimization of aggression against others. The more "sacred"—i.e., unquestionable and not rationally debatable—such a belief system becomes, the stronger its terror managing function (Pyszczynski, Motyl, & Abdollahi, 2009).

Similarly, the radicalization model of Doosje et al. (2016) finds that radical groups and their belief systems often share common elements: the perception of a serious problem in society; a strong feeling of dissatisfaction with current institutions; a strong "us versus them" distinction created from a feeling of superiority of one's own group's norms and values; and the legitimization of violence, especially against the "culprit" group held responsible for the situation. Radical belief systems can lead to voluntary isolation and distancing from the in-group, increased belief that authorities in the host culture are illegitimate and that the in-group is morally superior to themselves, and an increase in perceived distance to mainstream society and its members (Doosje et al., 2013). This can be toxic for society and can lead to radicalization of immigrant youth as well as resentment of the mainstream cultural group.

In a correlational study conducted in the Netherlands, nonradical young Muslims who had perceived more social injustice and threat to their (Islamic) in-group also reported stronger beliefs in the illegitimacy of Dutch authorities, superiority of their own group, and higher distance to members of the mainstream society. These components of a *radical belief system* positively predicted favorable attitudes toward Muslim violence and the participants' own intentions of using violence (Doosje et al., 2013). Similarly, the experience of being dehumanized can lead to reciprocal dehumanizing cognitions toward the other group, legitimizing aggressive intergroup attitudes and behavior (Kteily, Hodson, & Bruneau, 2016).

These different models converge on the need for marginalized and threatened individuals to engage in motivated cognitions to regain a sense of belonging, identity, and agency. Simplistic belief systems of a highly agentic

and perceptibly homogeneous group are a straightforward way to refill anxiety buffers and to regain agency. Radical groups provide clear injunctive norms describing how one should or should not behave, and other group members' behaviors act as sources for descriptive norms. In the intergroup context, this hardening of attitudes has highly negative effects, as it legitimizes hostility and aggression against the mainstream groups or unbelievers.

Step 4—Motivated Behavior

When a state of existential anxiety, uncertainty, and ostracism persists and attitudes toward members of the host country turn sour, aggression is an expectable response. We have discussed the legitimization of aggression on the in-group side of the cycle; the pathway on the out-group side is no different. Aggressive behavior on one side can elicit counteraggression, which can lead to a vicious cycle of escalation.

One example of a violent outburst of intergroup conflict took place in the eastern German town of Bautzen in 2016: In February, a fire broke out in a building that was planned as a migrant shelter for refugees. A crowd of onlookers tried to prevent firefighters from extinguishing the fire that eventually destroyed the building's roof, and some even showed "unashamed delight" watching the fire (Germany migrant shelter fire "cheered by onlookers," 2016). After months of nonviolent, subtle conflicts and animosities between a group of young refugees sheltered in Bautzen and a group of young right-wing residents, the conflict escalated when the group of refugees started throwing bottles across the market square. The ensuing clash between the groups required about 100 police officers to break up (Eastern German town of Bautzen witnesses clashes between locals & refugees, 2016).

From our cycle model's perspective, motivated cognitions legitimize violent solutions to intergroup conflicts and increase support for violence, terrorism, and extreme behavior to fight individuals threatening or violating one's worldview. Following social exclusion (i.e., a humiliating experience), individuals were found to report higher levels of religious affiliation and higher motivation to perform religious behaviors (Aydin, Fischer, & Frey, 2010). When experiencing Islamophobia coming from the majority group, highly religious Muslim minority members were less motivated to engage in the national culture of the majority and more oriented toward their own ethnic group (Kunst, Sadeghi, Tahir, Sam, & Thomsen, 2016). In a sample of Muslims living in the United States, having experienced at least one episode of discrimination or ostracism significantly predicted justification of Islamist suicide bombings (Victoroff, Adelman, & Matthews, 2012). Individuals who had experienced ostracism in their lives and were then further deprived of control over aversive noise stimulation showed more aggressive behavior than those who had control over the noise (Warburton, Williams, & Cairns, 2006).

Even though empirical evidence on motivated behavior among immigrants, refugees, and minority groups in general is scarce, this part of our cycle model elucidates the path individuals might take to deal with the threats they encounter when interacting with mainstream culture. Existential anxiety and uncertainty call for relief that can be provided by exaggerated identification with religious values, or any radical belief system that lends structure and a feeling of identity and agency. Unfortunately, such belief systems may also rationalize detestation of and violence against people who violate those beliefs. The resulting displays of behavior reach individuals on the opposite side of the system and again elicit reciprocal reactions, and the cycle perpetuates itself.

To summarize, the out-group's perception of stereotyping, intergroup biases, or even physical threats activates the experience of threat, which is accompanied by an inhibited, anxious motivational-affective state. This state can be mitigated by engaging in motivated cognition to restore agency, a sense of control, and identity. These cognitions can then find expression in motivated behavior or behavioral intentions. Again, this behavior might reinforce intergroup conflict and elicits a reciprocal dynamic in the intergroup interaction.

Channels of Social Interaction

By understanding interactions between in-group and out-group members as a dynamic system of perception of threat that engages a motivational-affective state, motivated cognition, and motivated behavior, we assume that each group goes through its own version of this cycle; the cycles intersect when the mainstream in-group interacts with the out-group of immigrants and refugees. This contact can have three different forms: (1) positive, prosocial contact and helping behavior, for example, between refugees and volunteers helping in the refugee shelters leading to rewarding experiences on both sides; (2) negative contact, for example, in the form of intergroup conflict and violent altercations fueling further hostility between the groups; or (3) overall avoidance of contact, for example, in-group members turning their heads away from refugees, avoiding situations where social contact would be likely, and refugees staying separated from the mainstream culture, creating parallel societal structures.

The role of media in intergroup relations. However, the main source of intergroup contact is the media. Although immigration and the refugee situation have been the most important topics on a European level (Eurobarometer, 2017), many citizens of host countries have in fact never personally interacted with refugees. According to a poll conducted in October 2016, 47% of 1041 surveyed German citizens reported having spoken to a refugee at least once during the previous months, but only 19% had actively engaged in any kind of activity with refugees

(Umfrage zeigt, 2016). These numbers indicate that for members of the mainstream culture, the major form of "contact" and the major source of information about the group of refugees are the media. Thus, opinions and attitudes toward the out-group are also largely formed through information gathered from social media or the news.

While positive reports serve to promote peaceful coexistence between the groups, reports of conflict, violence, and discrimination perpetuate intergroup hostility and alienation. Hence, the media have enormous influence on the public perception of threats by amplifying certain aspects thereof or creating media hype (Vasterman, Yzermans, & Dirkzwager, 2005). News outlets are in control of the flow of information transmitted to the general public, and the narratives they choose to transmit to the public depend heavily on their political orientation: left and center-left newspapers tend to focus their reports on social causes and personal reasons behind terrorist activities and criticize the culture of fear propagated in other sources, while right and center-right newspapers tend to take an ethnocentric or religious perspective, painting an "us versus them" picture of the situation. Often, the latter call for "unqualifiedly repressive" retaliative responses and choose emotionally arousing words, such as *threat, alarm, fear, terror, war*, or *psychosis*, thereby amplifying and spreading the perception of threat (Sensales et al., 2014). It is not only the wording of reports that influences threat salience: Some topics and incidents are selectively ignored, while especially severe and dramatic stories tend to get exaggerated coverage (Chermak & Gruenewald, 2006). Since people under threat look preferably for worldview-consistent information (Jonas et al., 2003), the salience of certain topics in itself is a self-perpetuating circle.

From the perspective of the population, the consumption of media plays a key role, as the media provide simple means of social integration. Since humans feel the need to "collectively negotiate their cultural worldviews" (Miller & Landau, 2005, p. 85), they can form their behaviors and strengthen personal values by identifying with role models presented by the media. As such, the media create and influence the salience of descriptive social norms. In the wake of mortality reminders, people tend to divert their attention away from further death-related information and to avoid objective self-awareness. In such situations, television provides a means to avoid threat and affiliate with cultural values simultaneously (Miller & Landau, 2005).

In conclusion, the media can influence the cycle of intergroup conflict in two important ways: on the one hand, by reducing the propagation of mortality reminders, and so reducing the potential for anxiety in their recipients; and on the other hand, by providing examples of prosocial and peaceful interactions, forming positive and constructive descriptive social norms their recipients can orient themselves by.

CONCLUSION

In this chapter, we presented a number of findings from the threat literature to explain the self-perpetuation of intergroup conflict and radicalization. We argued that the emergence, perpetuation, and escalation of intergroup conflicts result from threats eliciting the need to defend one's worldview by engaging in a motivational-affective state, motivated cognition, and motivated behavior in social interactions. This, in turn, influences individuals belonging to other groups, perpetuating the loop.

This research implies that to decelerate the cycle of intergroup conflict, efforts should be made to reduce exposure to death reminders and convey a feeling of control to lessen the impact of mortality cues. Furthermore, it would be helpful to provide opportunities for people to satisfy at least some of their existential needs, which is the basic requirement for well-being (cf Deci & Ryan, 2000). For example, it is important to allow both in-group and out-group members to make use of anxiety buffers to bolster their self-esteem as members of meaningful groups that project prosocial values and norms. For that, we need to create opportunities for out-group members to participate in everyday social life and provide access to infrastructure; this way, out-group members can experience involvement in the mainstream group and satisfy a need for relatedness. Taking part in the social life and understanding the structures of the mainstream group can enhance the feeling of competence. Importantly, allowing refugees to participate on a voluntary level instead of compelling them to do so allows them to satisfy the need for autonomy.

In situations of threat, defenses can be redirected to reduce antisocial and hostile outcomes. When prosocial norms on a personal and social level are salient, people can project general injunctive norms by promoting peaceful behavior as a moral norm as well as descriptive norms by acting in a prosocial way—allowing all to peacefully coexist.

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Chapter 20

Consumer Culture as Worldview Defense: A Terror Management Perspective*

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"Modern man is drinking and drugging himself out of awareness, or he spends his time shopping, which is the same thing," Ernest Becker noted in *The Denial of Death* (Becker, 1973, p. 284). Although the tendency to consume more than one really needs is not necessarily unique to human beings, humans appear particularly talented to use money, material possessions, and brands to differentiate themselves from fellow humans through complex "do's" and "don'ts" rules that are sometimes difficult to understand. Owning expensive cars, buying national products, and wearing the latest designer clothes may do more than just make consumers feel good. Attributing symbolic meaning to consumption and material possessions may help them deal with the fact that they too are just mortal animals.

According to terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1986), the unique human capacity to reflect upon their own mortality creates an existential dilemma: human beings' awareness that their own death is inevitable conflicts with their strong striving for self-preservation. To deal with this unfortunate fact of life, people rely on a dual-component anxiety buffer, which consists of (1) faith in shared belief systems (cultural worldviews) that offer literal or symbolic immortality and (2) a sense of being a valuable citizen within one's worldview (self-esteem). Investing in and maintaining these components enable individuals to obtain a form of (symbolic) immortality that protects them from existential angst. The maintenance of cultural worldviews can include feelings of nationalism,

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religion, prejudice, the desire for offspring, and the rejection of wild nature (Burke, Martens, & Faucher, 2010; Hayes, Schimel, Arndt, & Faucher, 2010; Martens, Burke, Schimel, & Faucher, 2011), and in modern affluent countries, materialism and materialistic consumption. Materialism can be explained as a means of obtaining symbolic immortality in (Western) society, in which a person's worth is to a great extent defined by that which he or she owns. As Arndt and colleagues put it: "to the extent that money is a pervasive barometer of self-worth, it tells us not only how much our car is worth, but how much we, as the person who holds the keys, are worth" (Arndt, Solomon, Kasser, & Sheldon, 2004, p. 203). With this it seems that consumer-related behavior can be seen as a way to boost one's self-esteem and by doing so feel like an appreciated member within one's culture.

Between 2004 and present, more than 50 experimental studies, and a handful of studies using interviews or surveys, empirically investigated the role of existential anxiety in materialism and consumption. This chapter zooms in on the consumer domains in which a fear of death appears particularly relevant and that have captured most empirical attention. The chapter starts out by exploring a fundamental question regarding the relationship between existential concerns, the symbolic value of money and greed (i.e., does a fear of death at least partially explain human's incessant striving for more money and possessions?). Next, the chapter elaborates on the different ways in which consumption could suppress a fear of death, by looking at specific qualities of products and brands, and the cultural worldviews they represent, such as nationalism or status. We then discuss research that has studied key moderators of consumer responses, and examine the different contexts that could induce fear-related consumer responses, ranging from "accidental" forms of influence such as television programs to the intentional use of death reminders in advertising contexts. We conclude by identifying avenues for future research that could further strengthen theoretical assumptions and increase insight into the relationship between death awareness, materialism, and consumption.

THE SYMBOLIC VALUE OF MONEY AND THE GREEDY HUMAN BEING

Conspicuous consumption pertains to the (illusioned) premise that one can never have too much money or possessions, as a cultural counterpart to the biological need to consume (Solomon, Greenberg, & Pyszczynski, 2004). Whereas the American dream may be regarded as an extreme representation of this ultra-materialistic worldview, Solomon et al. (2004) have proposed that the desire to acquire more money and material possessions holds for modern and ancient cultures alike to differentiate one's self from peers and to gain power and status, even though this striving may not be satisfying in the long run. They quote, for example, Aristotle, who noted that: "With

regard to money, however, which has become exchangeable against everything, the illusion arises that it is good to accumulate it without limit. By doing so, man harms both the community and himself because, concentrating on such a narrow aim, he deprives his soul and spirit of larger and more rewarding experiences" (as cited by Solomon et al., 2004, p. 142). This morale is underscored by the Greek myth about King Midas, who was granted the power to turn into gold everything that he touched, a gift currently still known as the "Midas touch." The sage takes a sadder turn when king Midas touches his daughter and she turns into a golden statue.

If there is no ultimate reward in this incessant striving for more money and goods, and if ancient myths keep telling us that pursuing it consistently ends in misery, why do people still do it? TMT suggests that humans' obsession with acquiring money and goods may stem, in part, from their need to suppress the thought that they are mortal beings. Several studies have examined this premise regarding perceptions of the strongest symbol of materialistic achievement (i.e., money) and humans' tireless striving to acquire more possessions (i.e., greed). One such study found that participants exposed to death became greedier and consumed more resources in a forest-management task (Kasser & Sheldon, 2000; Study 2). American students were asked to imagine that they owned a company that had to bid against three other companies to harvest timber in a national forest. Participants were reminded that the forest might disappear if companies continually made large bids. They were asked to indicate how much they would like to profit more than the other companies (*greed*) and how much they expected other companies to try to cut large amounts each year (*fear*). Findings showed that a subtle reminder of mortality (mortality salience; Chapters 1 and 4, this volume) triggered higher levels of greed (but not fear) compared to the control condition. Mortality salience participants wanted to harvest 12 to 13 more acres of forest than participants in the control condition. The effects of mortality salience on greed were not moderated by extrinsic goal orientation, (i.e., individual differences in the desire for money, fame, and beauty; cf Kasser & Ryan, 1996).

Another study also reported more greed following mortality salience, but in this study extrinsic goal orientation played a significant role in producing the expected effects (Cozzolino, Staples, Meyers, & Samboceti, 2004). The study distinguished terror management from transcendence management motives, based on research on near-death experiences and posttraumatic growth, which reveal that many people who nearly die come to view seeking wealth and possessions as empty and meaningless. For the death reflection manipulation, participants were asked to imagine "waking up in the middle of the night in a friend's apartment on the 20th floor of an old, downtown building" to the "sound of screams and the choking smell of smoke." The scenario described how participants' attempts to escape were futile and eventually led to death. After reading the scenario, participants were asked to

reflect on their death, their life, and their loved ones. This manipulation induces an intense reflection on death, in contrast to the subtle mortality salience manipulations featured in most TMT research that merely increase the accessibility of death-thoughts (see Chapter 4, this volume). Compared to a neutral control condition, death reflection reduced greed as measured by the amount of raffle tickets participants took purportedly at the expense of other future participants, but only among highly extrinsic participants (Experiment 1). A study explicitly comparing the typical TMT induction of mortality salience to death reflection (Experiment 3) further suggested that, compared with death reflection, mortality salience increased greed, but only for students who scored high on extrinsic value orientation. These findings, along with Kasser and Sheldon (2000), demonstrate how terror management processes aroused by the subtle activation of death-thoughts can trigger enhanced greed.

Other research has examined the value attributed to money following mortality salience and the effects of the presence of money on death anxiety. In one study, Polish undergraduate students showed that individuals assigned to a mortality salience condition overestimated the size of Polish coins and bank notes more than participants assigned to a control condition (Zaleskiewicz, Gasiorowska, Kesebir, Luszczynska, & Pyszczynski, 2013; Study 1), suggesting that the subjective value assigned to money can affect judgments of its physical magnitude. This effect was replicated by Wang (2014, Study 3) for Canadian coins following a standard mortality salience writing exercise (vs control condition). The latter study also reported a mortality salience effect on participants' willingness to permanently forego pleasant things such as sunshine, spring, and chocolate in exchange for two million dollars (cf Zhou, Vohs, & Baumeister, 2009). Another study (Zaleskiewicz et al., 2013; Study 2) showed that mortality salience affected perceptions of "how rich is rich": undergraduate students induced to think about their mortality via a fear of death questionnaire (see Chapter 4, this volume) used higher monetary standards to define a person or family as rich than those in the control condition, especially those students with a symbolic attitude toward money, as measured by the Money Attitudes Questionnaire (Gasiorowska, 2008). Moreover, adults reminded of death desired higher compensation for waiving the immediate payment of money than adults in a dental pain control condition, especially those with a symbolic attitude toward money. One study (Experiment 4) also showed reverse effects of money on death anxiety. Participants who were primed with (real or play) money (cf Zhou et al., 2009), by asking them to count the overall value of money, scored lower on a fear of death questionnaire than control participants who received white pieces of paper of the same size and with the same numbers as those printed on the monetary notes. These convergent findings indicate that the concept of money can function as a death anxiety buffer.

To summarize, there is converging evidence that the symbolic value of money can serve to suppress a fear of death, and that a fear of death triggers the desire to have more money or goods, especially among individuals with goals that can only be satisfied through the acquisition of materialistic goods (extrinsic goal orientation; money attitudes).

MATERIALISM AND CONSPICUOUS CONSUMPTION

Terror management research has also linked a fear of death to materialism. Materialism "reflects the importance a consumer attaches to worldly possessions. At the highest levels of materialism, such possessions assume a central place in a person's life and are believed to provide the greatest sources of satisfaction and dissatisfaction in life" (Belk, 1984, p. 291). Others have defined materialism as "the importance a person places on possessions and their acquisition as a necessary or desirable form of conduct to reach desired end states, including happiness" (Richins & Dawson, 1992, p. 307). Both definitions thus propose that materialistic individuals assign a central role to worldly possessions and assume that these can bring happiness and satisfaction in life. Specific aspects of worldly possessions or "rules" of consumption, such as what makes a product high status, are not part of the definition, but Richins and Dawson's trait materialism scale does include items that specifically refer to luxury, status, and "expensive cars and clothes." The scale consists of three subscales that assess the centrality of possessions for an individual's self-concept; possessions as an indication of success; and possessions as a source of happiness. Empirical evidence that directly linked mortality concerns to scores on a materialism scale is limited. Only one study explicitly examined a direct relationship between trait materialism scale and a fear of death, and found that negative death beliefs, obtained from an adjusted version of the Death Perspectives Questionnaire (Spilka, Minton, Sizemore, & Stout, 1977), correlated positively with materialism (Christopher, Drummond, Jones, Marek, & Therriault, 2006). One other study examined mortality salience effects on materialistic values by asking participants to choose between tangible and experiential products in a vignette study (Wang, 2014; Study 2) or between two magazines that highlighted different levels of materialistic values: money versus Canadian family (Wang, 2014; Study 4). These experiments did not show differences between participants in the mortality salience and control conditions.

Quite a few terror management studies have assessed mortality salience effects on conspicuous consumption. Conspicuous consumption relates to, but not perfectly fits, the self-concept and success dimensions of materialism (Richins & Dawson, 1992), revealing an interesting yet awkward paradox between wanting to stand out from others and using culturally approved symbols to achieve this goal. Theoretically, conspicuous consumption per se is not necessarily related to culture, or rooted in cultural differences; it has

been argued before that all cultures use material symbols to distinguish the haves from the have-nots (Solomon et al., 2004). In the next subsections, we discuss the different ways in which brands and products may become symbols of specific cultural worldviews that have received most empirical attention in the last decades, and examine their relationship with existential angst from a terror management perspective.

Luxury and status. One obvious way to suppress a fear of death in the consumer domain is by turning toward products and brands that are highly regarded by peers because of their status. Several studies have examined whether a fear of death increases preference for high status goods. A cross-sectional survey (Choi, Kwon, & Lee, 2007) among approximately 3000 American adults showed a positive relationship between self-reported worry about becoming a victim of terrorism and brand name consumption, which was measured by combining responses to the following two statements: "I try to stick to well-known brand names" and "I prefer to buy products with designer names." Replicating past research with Western samples, a study among 60 Japanese students showed a marginal tendency to prefer high-status over low-status products following a mortality salience induction, compared with a control task (Heine, Harihara, & Niiya, 2002). Participants were presented with two advertisements for high-status brands (Jaguar automobile and Youkan, a Japanese sweet, made by a famous and costly brand name) versus low-status brands ("Duet," a small, budget-friendly automobile made by Toyota and Pringles potato chips) from different product categories: automobiles and fast-moving consumer goods (FMCG). The marginal effect of mortality salience was caused by mortality salience participants' lower evaluation of the low-status FMCG Pringles; no differences between mortality salience and the control condition were observed for the other products. Again, however, the authors did report a marginal effect for participants in the mortality salience condition to favor high-status over low-status goods.

Wang (2014; Study 1) also examined attitudes toward high-status products (Rolex watches and BMWs) versus low-status products (KIA automobiles and Pringles) as a function of a mortality salience induction versus a control assignment among 122 undergraduate students. This study featured two different mortality salience conditions. In one condition, participants thought about their own deaths while in the other condition they contemplated the death of a loved one. Findings showed that mortality salience participants who thought about their own death had marginally higher preference for luxury products than control participants and significantly higher preference for luxury items than participants who wrote about the death of a loved one. This study found no differences between experimental conditions for nonluxurious brands, contrasting the findings from Heine et al. (2002).

A study by Chopik and Edelstein (2014) examined spending intentions on four luxury products (a TV, watch, cell phone, and camera; cf Kesebir,

Chiu, & Pyszczynski, 2013) versus two nonluxury products (a ballpoint pen and a package of toilet paper), following mortality reminders induced by webpage advertisements among American adults (Study 3). A small, but significant, difference was observed between the participants in the mortality salience condition and those in the control condition: mortality salience participants indicated they wanted to spend more money on luxury products than those in the control condition. This difference was not observed for nonluxury products. In their fourth study, death-related thoughts mediated the relationship between mortality salience and willingness to spend money on the same luxury items, providing additional evidence that death concerns increase the willingness to spend on luxury.

Another study tested whether the knowledge that others witness culturally approved behavior is essential in dealing with existential anxiety, and enhances mortality salience effects on consumption-related behavior (Fransen, Smeesters, & Fennis, 2011). Study 1 found that participants rated a luxurious brand (Mercedes) more positively after a mortality salience writing exercise than when they wrote about a difficult exam, but only if they believed that another participant would evaluate their ratings (social presence condition). This difference was not significant in the no social presence condition. A second study used a comparison between the nonluxury brands Medion and Tawa versus the luxury brands Armani and Mercedes-Benz among Dutch students. Findings showed that mortality salience led to a more positive evaluation of the luxury brands than the control condition, but again only for participants in the social presence condition. In addition, participants in the social presence condition rated the nonluxury products more negatively when mortality was salient than control participants.

Overall, these studies lend some support for a positive effect of mortality salience on preferences for luxury—however, the effect is small and may depend on what is considered the "right" consumption standard in a given cultural milieu. One study found marginal differences between mortality salience and control conditions for luxurious brands, another study found mortality salience differences only for nonluxurious brands, and another study found only mortality salience effects on brand evaluation following a manipulation of social presence. One study found a significant main effect for luxurious products (vs FMCG) in a large sample of American adults. Defining materialism as the mere placement of value on the acquisition of luxury products may not do justice to modern brand consumption, which is not only symbolic, but also experiential and functional (cf Park, Jaworski, & MacInnis, 1986), and constantly changing. Rindfleisch and Burroughs (2004) have noted that postmodern consumers are becoming more skeptical of high-status brands, and may prefer low-status brands over high-status ones, and brands that signal authenticity over luxurious brands (Holt, 2002). Such differences in cultural consumption standards may represent important

moderators of the effects of a fear of death on preference for specific brands and products.

Cultural variations in the way specific consumption patterns connect to self-esteem are quite likely; for example, the nouveau riche may own fast cars and luxurious swimming pools as displays of success and happiness, but "old money" classes reject (i.e., stand above) such ostentatious displays of luxury. At times, cultural differences may even lead to clashes about product symbolism, such as when the famous French house Louis Roederer of Cristal champagne was criticized for distancing themselves from the adoption of Cristal by the American rap scene, leading to a Cristal ban by the famous rap artist Jay Z for what he felt was off-hand, patronizing disrespect for the culture of hip hop (Franklin, 2006). Future studies may further look into the specific role of brand and product symbolism by examining whether mortality salience has divergent effects on appreciation of brand names and products symbolic for different consumer groups, or by tracking mortality salience effects on the appreciation of brands with changing reputations over time. Providing evidence that mortality salience affects different consumer-related worldviews depending on consumer target groups and subcultures would also further attest to the cultural aspect of conspicuous consumption.

Brand familiarity. Some studies examined whether a fear of death increased preference for known products in general, based on the assumption that under death anxiety people appreciate safety, abhor danger, and rely on familiar cultural symbolism (see Chapter 5, this volume). Building on this premise, when primed with death, people will show a greater appreciation of familiar concepts and this should also be the case in the consumer domain. Dar-Nimrod (2012) reported that, compared to control conditions, mortality salience increased overall product preference on a composite index of eight products known by participants (BMW and Mercedes vehicles, Kia and Hyundai vehicles, McDonalds and Burger King restaurants, Tommy Hilfiger and Diesel jeans). Other terror management studies that made brand familiarity comparisons as the explicit focus of their study, however, did not find consistent mortality salience effects. One experiment showed that, after a mortality salience prime, participants' brand choice and ratings did not favor a familiar product more than an unfamiliar one made by the same (well-known) brand, nor did they significantly favor familiar brands more than unfamiliar ones (Van Bommel, O'Dwyer, Zuidgeest, & Poletiek, 2015). In another study, mortality salience increased attitudes toward advertisements and purchase intentions regardless of brand familiarity (Das, Duiven, Arendsen, & Vermeulen, 2014; Study 2).

As with the preference for luxury, there is evidence that the effect of mortality salience on preferences for brand familiarity may be moderated by theoretically relevant variables. Specifically, there is some evidence that mortality salience increases preference for familiar brands particularly for materialistic individuals. Rindfleisch, Burroughs, and Wong (2009)

conducted a survey and an experiment to test the premise that highly materialistic individuals form strong connections to their brands as a response to mortality concerns. The survey measured self-brand connection (Escalas & Bettman, 2003), or the degree to which a consumer has integrated a brand into his or her self-concept, and communal-brand connections (Keller, 2003), or the degree to which a consumer feels a sense of communal identification with other brand users. Survey findings showed that materialism was positively related to self- and communal-brand connections only for participants with high self-reported fear of death. These relationships were not observed for brand loyalty, habituation, or switching costs. Findings from the experiment replicated this pattern: materialism positively predicted self- and communal-brand connections following mortality salience, but not in a control condition.

Overall, robust empirical support for the premise that mortality salience differentially affects evaluations of familiar and unfamiliar brands and products is lacking; mortality salience may increase brand connections for materialistic individuals, but does not influence brand evaluation for all consumers alike. More evidence is needed to examine mortality salience differences on product and brand preference, using a broad range of product classes, such as symbolic versus functional products, and different brand personalities, such as sincere versus exciting brands (Aaker, 1997). It may be that certain brand personalities are better suited to soothe existential concerns than others, and that symbolic products are more "culturally loaded" than functional products and therefore better representations of specific consumer (sub)cultures. Future research should also further look into the role of materialism and other potential moderators such as the extent to which a product or brand is connected to consumers' self-esteem.

MORTALITY SALIENCE AND PATRIOTIC CONSUMPTION

Research on worldview defense (see Chapter 1, this volume) suggests there are two common ways of affirming one's worldview: increasing support for worldview-consistent persons, actions, and symbols, and decreasing support for worldview-threatening persons, actions, and symbols (Friese & Hofmann, 2008). In the consumer domain, this is most clearly illustrated by the American nationalistic consumer behavior in the aftermath of 9/11, after president Bush encouraged the American people to go shopping. In the quarter following the terrorist attacks, expenditure of American consumers soared. However, "despite the increase in consumer expenditures, in the same quarter, imports of goods and services dropped by 3.4%. These data suggest that after 9/11, American consumers primarily relied upon domestic products to fulfill their needs while they simultaneously decreased their spending on foreign products" (Friese & Hofmann, 2008, p. 1388).

The proposition that mortality salience leads to a preference in domestic over foreign products has been tested in various experimental studies. For example, Jonas, Fritsche, and Greenberg (2005) found that, after a mortality salience prime, German participants had a greater preference for aspects of the German culture (such as the German Mark, German cars, or the German cuisine) relative to aspects of foreign cultures, demonstrating that mortality salience leads to a heightened preference for aspects of one's own culture. Another study further investigated the effects of mortality salience on the evaluation and consumption of domestic versus foreign food products. In the first experiment, Friese and Hofmann (2008) assigned Swiss participants to a mortality salience or control condition and were asked to sample and evaluate either a Swiss soda (Rivella) or a foreign soda (Dr. Pepper, from America). Findings showed a marginally significant interaction-effect between mortality salience and type of soda on the evaluation and consumption of the drink. Mortality salience decreased liking of the foreign soda, but did not affect liking of the domestic soda. Mortality salient participants also consumed more of the domestic than of the foreign soda, but this was due to a marginal increase in consumption of the domestic product, not because of a decrease in consumption of the foreign product. Similar results were found in the second experiment, in which participants were assigned to a mortality salience or control condition and subsequently asked to sample either Swiss chocolate (Lindt) or foreign chocolate (Milka, from Germany). An implicit association test was used to measure their product evaluation (liking) and afterward it was measured how much participants had eaten of the chocolate (consumption). Results showed interaction-effects of condition and type of chocolate on both liking and consumption. In both experiments, however, the simple effects showed that increased support for the local products and decreased support for the foreign products were nonsignificant for both dependent variables. The authors conclude that there is some preliminary evidence that mortality salience can lead "to defending one's culture through these amplified preferences in terms of evaluation and consumption" (Friese & Hofmann, 2008, p. 1392).

Fransen, Fennis, Pruyn, and Das (2008) explicitly aimed to test whether the classic terror management phenomena of in-group favoritism and outgroup derogation works similarly in the consumer domain, proposing that mortality salience induces a more positive perception of domestic products and a more negative perception of foreign products (Experiment 3). They used a sample of Dutch students and adopted a subliminal prime (a funeral-insurance brand) as a death reminder for half of the participants. Results showed that mortality salience led to a more positive attitude toward domestic (food) products (such as Gouda cheese or Grolsch beer) and a more negative attitude toward foreign (food) products (such as Carbonell olives and Corona beer). These findings suggest that there are various forms in which consumer behavior may function to reduce existential terror: next to bolstering ones' self-esteem directly, as is the case with consumption behavior, it is

indeed possible to use consumerism as a way to adhere to ones' cultural worldview by favoring domestic symbols (such as food products) and condemning foreign symbols.

These findings were replicated by Liu and Smeesters (2010). They conducted four experiments and used several types of products, ranging from food products to other consumer goods, and looked at different brands and product types: fashion stores, televisions, beverages, and snacks. Across all product types, mortality salience led consumers to have a higher preference for the domestic brands compared to the foreign brands. In the final experiment, they also tested the effect of a "pro-domestic claim." After the mortality salience prime, participants were presented with an advertisement for a domestic or foreign beer, with either a pro-domestic claim or a neutral one. Results indicated that the claim worked as a moderator in the effect of mortality salience on brand liking and purchase intention. The pro-domestic claim didn't enhance the effect of mortality salience on the domestic product (as hypothesized by the authors), but it did nullify the negative effect of mortality salience on the liking and purchase intention of the foreign product, meaning that participants who were reminded of their mortality and saw the foreign product with a pro-domestic claim, had a more positive evaluation and higher purchase intention than participants in the control condition. Liu and Smeesters conclude that mortality concerns turn country-of-origin information into a crucial factor for brand evaluations because a favorable or unfavorable attitude toward domestic (worldview-validating) or foreign (worldview-threatening) brands can buffer death-related anxiety.

This proposition was further supported by the study of Rangan, Singh, Landau, and Choi (2015), who (in Experiment 2) used a sample of American students to investigate the effect of mortality salience (induced by death-related television) on brand and advertisement attitude. Mortality salience led to more favorable attitudes toward an American camera than toward an identical camera made in China, but only when there was enough delay between mortality salience and the advertisements so that nonconscious death-related thoughts were triggered. Similar results were found for advertisement attitudes. Since both cameras were from the same fictional brand and pretests showed no differences in favorability, quality, and familiarity effects. A third experiment showed there were no effects of affect or involvement (Rangan et al., 2015), lending additional support to the core hypotheses.

Overall there is substantial evidence that nationalistic consumption can function as a worldview defense, as studies have shown that mortality salience leads to preference for domestic over foreign products. However, several studies only observed an effect of either in-group favoritism or out-group derogation; future research should examine why this is the case. Potential explanations might be that the effects depend on the selected brand or product categories, the extent to which consumers identify with their own

culture, or situations that might change the perception of national and foreign products. For example, within a subgroup of wine connoisseurs, drinking French wine may be more suited to bolster one's worldview than drinking a national wine. Nevertheless, on a practical level, death concerns will likely lead to the selection and preference for a domestic (vs foreign) product when people are deciding between the two.

BOUNDARY CONDITIONS OF MORTALITY SALIENCE EFFECTS ON CONSUMER BEHAVIOR

In the previous section, several effects of mortality salience on consumer-related outcomes were discussed. In this section, we further examine boundary conditions for these effects to occur. We consider personal and situational differences between consumers as possible moderators that strengthen or diminish the effects of mortality salience. We focus on self-esteem, materialism, and worldview affirmation as moderators of mortality salience effects, since these variables are most closely related to the propositions of TMT. In doing so, we present empirical work further refining TMT in the context of consumer behavior.

Self-esteem is inherently related to TMT since it can be perceived as key in the propositions of the theory. Perceiving oneself as a meaningful member of one's culture is argued to result in higher levels of self-esteem, which serves as a buffer against existential anxiety. This implies that people with high (dispositional) self-esteem should be less susceptible to mortality salience effects. Indeed, early empirical research demonstrates that both increasing self-esteem by providing positive feedback and dispositional high levels of self-esteem reduce the tendency to deny vulnerability to a short life expectancy, reduce levels of anxiety when exposed to a death-related video, reduce anxiety levels when anticipating a painful shock (Greenberg et al., 1993; Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992), and decrease worldview defense effects (Arndt & Greenberg, 1999; Harmon-Jones et al., 1997; but see also Burke et al., 2010).

In the consumer-related context, self-esteem has received some attention as well. A series of studies by Mandel and Smeesters (2008) demonstrated that the effect of mortality salience on consumer-related outcomes were stronger for people with low versus high self-esteem. The first experiment among marketing students showed that participants who were reminded of their mortality chose a greater number of grocery items from a shopping list, spent more dollars, and spent a higher percentage of their budget on groceries for a party, than participants in the control condition (writing an essay about what would happen when they went to the dentist). For the "amount of items chosen" dependent variable, a significant interaction effect, was also found between mortality salience and trait self-esteem, such that the mortality salience effect was significant for participants low in self-esteem and not

for participants high in self-esteem. This effect was further explained by the authors as an escape from self-awareness. A subsequent study tested this explanation in a sample of college students. The critical measure was the selection of a chair either facing toward or facing away from a mirror; the selection of the away facing mirror is perceived as a reflection of escaping self-awareness (Twenge, Catanese, & Baumeister, 2003). Hypothetical snack and drink choices for 7 consecutive days were included as the dependent variable. The results showed that low-self-esteem participants who wrote about death more frequently chose a chair facing away from a mirror than participants in the control condition. This effect was not observed for high self-esteem consumers. Moreover, a significant interaction effect between mortality salience and self-esteem was found on hypothetical snack choice. The effect of mortality salience on increased snack choice was only significant for participants low in self-esteem and not for participants high in self-esteem. A mediated moderation analysis provided support for the mediating role of escape from self-awareness in the effects of mortality salience and self-esteem on the number of snack choices. In Experiment 3, the results of Study 2 were replicated while using a different self-awareness measure and measuring eating behavior (amount of cookies consumed in an ostensible taste task) as a dependent measure. The final study manipulated self-awareness by placing participants in front of a mirror during either the complete experiment or during the first part of the experiment (escape self-awareness) and tested a three-way interaction between mortality salience, self-esteem, and self-awareness on purchase quantities. Mortality salience had a significant effect on the purchase quantities for participants low in self-esteem in both self-awareness conditions and the control condition, but low self-esteem participants in the mortality salience condition purchased marginally fewer items than low-self-esteem participants who wrote about pain (control condition) in the self-awareness no escape condition. As expected, mortality salience did not affect purchase quantities of high self-esteem consumers in all the self-awareness conditions. The results offer support for the notion that dispositional self-esteem moderates the effects of mortality salience on excessive consumption and explains the low self-esteem effects as being driven, in part, by the need to escape self-awareness (see also Wisman, Heflick, & Goldenberg, 2015).

In their studies on indulgent food consumption and donating behavior, Ferraro, Shiv, and Bettman (2005) focused on domains that are either important or not for consumers' self-esteem. The rationale is that consumers may derive their self-esteem from different domains. For some consumers, appearance might be an important source of self-esteem, while other consumers might derive their self-esteem from being perceived as social. When mortality is salient, consumers will particularly bolster the values that are important for their self-esteem and, importantly, are attainable to live up to. Bolstering self-esteem, however, often costs limited self-regulatory capacity.

The authors, therefore, hypothesized and found that consumers used greater self-regulation for values that were important and achievable for their self-esteem and less for unimportant and difficult to attain values. In the context of choosing between indulgent food (chocolate cake) and fruit, women with low body-esteem did not spend their resources on regulating their food intake after a mortality salience prime, because they were unable to derive self-esteem from their body, which resulted in selecting the chocolate cake. On the other hand, women with high body-esteem did spend their resources on regulating their food intake because it was attainable for them to derive self-esteem from their appearance, which helped them to select the healthy option. Men did not differ in their choice for chocolate cake across the high and low mortality salience conditions. Similar results were found in a different context in which virtue was considered as a source of self-esteem. In this study, consumers high on virtue as a source of self-esteem (measured with the Contingencies of Self-Worth Scale; Crocker, Luhtanen, & Cooper, 2003) contributed more of their potential lottery winnings to charity when mortality salience was high, compared to the low mortality salience condition. This effect was not found for consumers low on virtue as a source of self-esteem. Together, these studies demonstrate that the effects of mortality salience on consumer-related outcomes depend on whether the outcome is an important source of self-esteem or not, and the extent to which consumers perceive themself as being able to live up to these standards.

In their research on the effects of advertisement-induced mortality salience on consumer responses, Das et al. (2014) also examined the role of self-esteem as a moderator of terror management effects. They hypothesized that the effects of mortality salience on purchase intentions depend on the type of product such that the effect is stronger when it concerns a product that is relevant for consumers' self-esteem. The results did not confirm this hypothesis. Although advertising-induced mortality salience did yield a main effect on purchase intentions, this effect was not stronger when it concerned a product that was relevant (vs irrelevant) for consumers' self-esteem. The authors discuss that relevance might not have played a role in their study because of the adopted operationalization of the irrelevant products. The products in the irrelevant control condition might also have been perceived as suited to boost self-esteem since they were related to important pillars of Western culture (newspaper reading and art). On the other hand, it could be argued that mortality salience might merely increase the motivation of buying and spending money independent of the product's ability to boost self-esteem (though theory and the earlier research noted above suggests otherwise).

Choi et al. (2007) examined in a survey study (data from the 2003 Life Style Study by an international marketing communications firm) the moderating roles of both global self-esteem and self-esteem contingency (i.e., ego involvement) in the effect of mortality salience on materialistic consumption.

Global self-esteem is defined as one's overall sense of self-worth. Self-esteem contingency, or ego involvement in materials, is defined as the extent to which materialism is an important source of self-esteem. The results demonstrated that self-esteem contingency moderated the effect of mortality salience on materialistic consumption (i.e., brand name consumption and compulsive consumption), but global self-esteem did not. This means that mortality salience effects on materialistic consumption are stronger for consumers who perceive materialism as an important part of their identity. However, global self-esteem did not serve as a buffer against mortality salience.

Together, the discussed studies show mixed results concerning the moderating role of self-esteem. A distinction between two types of self-esteem can be made. Global self-esteem is proposed as a buffer for existential anxiety, which reduces the need to increase self-esteem after a mortality salience manipulation. Domain-specific self-esteem (or self-esteem contingency) is more concerned with the source consumers derive self-esteem from when mortality is salient. It would be interesting for future research to further disentangle these two types of self-esteem. One could question, for example, whether consumers with high self-esteem do not engage in domain-specific self-esteem bolstering when mortality is salient because their global self-esteem is already protecting them for existential anxiety. So, do only people with low global self-esteem engage in domain-specific self-esteem bolstering after a mortality salience manipulation? For future research, it might also be interesting to see whether self-esteem indeed increases after consumers have the opportunity to bolster their self-esteem. So, does self-esteem indeed increase when consumers intend to spend more money, buy luxurious products, or donate money after a mortality salience prime?

Materialism. Another moderator that has been examined empirically in terror management research is materialism. In general, it is argued that mortality salience effects on consumer responses are stronger for materialistic consumers (see also previously discussed results concerning self-esteem contingency, or ego involvement in materials; Choi et al., 2007). Theoretically, materialism can be perceived as an important life value, so it might also be used as a source to bolster self-esteem when confronted with mortality. As discussed earlier, Rindfleisch et al. (2009) found that materialistic consumers form brand connections as a way to symbolically cope with existential anxiety. The reported experiment among American undergraduate students demonstrated that for participants in the mortality salience condition, materialism (measured with the Material Values Scale, Richins, 2004) was positively related with both self-brand connection and communal-brand connection. For participants in the control condition, materialism was unrelated to brand connections. No effects were found on brand loyalty. These results are notably in contrast with the escalation theory stating that materialistic consumers have an insatiable desire for material objects (Solberg, Diener, & Robinson,

2004). Since materialistic consumers are always in search for the next best thing, escalation theory predicts that these consumers are not inclined to invest in brand connections (Kasser, 2002). However, the observed findings do align with the replacement hypothesis, stating that materialistic consumers have strong connections with their possession (i.e., brands) since they use them as replacements for interpersonal relations. Hence, when confronted with mortality, materialistic consumers cling more to their brands as a symbolic replacement for interpersonal connections to strengthen their sense of meaning and purpose.

Ruvio, Somer, and Rindfleisch (2014) also studied the moderating role of materialism on posttraumatic stress, compulsive buying, and impulsive buying in a field and survey study. The field study took place in Israel with a group of people facing a mortal threat of terrorist attacks (i.e., mortality salience condition) and another group of people who were not under the direct threat of attacks (i.e., control condition). It was argued that mortality salience results in posttraumatic stress symptoms under these conditions and that these symptoms may in turn affect maladaptive behavior like compulsive and impulsive buying to release stress. These effects were expected to be stronger for materialistic individuals. As expected, there was a positive relationship between the mortality threat and posttraumatic stress symptoms. This relationship was moderated by materialism, such that posttraumatic stress symptoms were greater for highly materialistic (vs low materialistic) people. Moreover, posttraumatic stress symptoms were positively related to both compulsive and impulsive buying and these effects were stronger for high (vs low) materialistic people. This means that materialism strengthened the effects of mortality salience on posttraumatic symptoms as well as compulsive and impulsive buying.

In their second study, a survey among American participants, the authors aimed at explaining why materialism moderates the effects of mortality salience by examining the underlying roles of self-esteem and social support. Previous research indicated that materialistic people often have lower levels of self-esteem and weak social support networks (Christopher, Drummond, Jones, Marek, & Therriault, 2006). The results replicated the moderating role of materialism in the effect of mortality salience on both compulsive and impulsive buying. Interestingly, it was observed that this interaction effect only held for people with low self-esteem and not for people with high self-esteem. No effects of social support were observed. These results indicate that the observed findings may be driven by a lack of self-esteem; when mortality was salient, particularly high materialistic consumers engaged in compulsive and impulsive buying behavior to bolster their self-esteem.

Jointly these studies demonstrate that materialism as an individual characteristic plays an important role in mortality salience effects in a consumer context. One could argue that especially materialistic people perceive materialism as an important worldview, which they are motivated to bolster when

faced with a mortality threat. Interestingly, materialistic people typically have lower levels of self-esteem making them particularly likely to experience stress after a mortality prime (Chaplin & John, 2010; Christopher, Saliba, & Deadmarsh, 2009), resulting in more consumption. For future research, it seems important to further examine the moderating roles of materialism and self-esteem. Is it, for example, also true that low materialistic people have generally high self-esteem, protecting them from consumer-related mortality salience effects? Or, do low materialistic people not gain any self-esteem from materialistic consumption since this is not an important part of their worldview, and do they therefore use different coping mechanisms?

Worldview affirmation. As discussed earlier, consumers who are reminded of their mortality are often inclined to defend their worldview by preferring local over foreign products (e.g., Fransen et al., 2008; Jonas et al., 2005). Sullivan, Jonas, and Jodlbauer (2011) examined whether worldview affirmation moderates these effects. Based on previous research on wordview affirmation in the domain of social attitudes (e.g., Schmeichel & Martens, 2005), they argued that worldview affirmation reduces the effects of mortality salience on worldview defense in a consumer context. The idea is that offering people the possibility to affirm an important aspect of their worldview buffers against existential anxiety. This makes it unnecessary to defend one's culture and may possibly increase the extent to which people are open to "new" experiences (see also literature on self-affirmation theory; Steele, 1988). This idea was tested in an experiment in which mortality salience (yes vs no), worldview affirmation (yes vs no), and product type (foreign vs local) were manipulated and willingness to pay for the products was measured as a dependent variable. Participants in the worldview affirmation condition were presented with a diary entry, which contained positive information about one's culture to increase worldview security. The results showed that among consumers whose worldview was affirmed, mortality salience resulted in increased willingness to pay higher prices for foreign products compared to when mortality was not salient. Interestingly, no effect of worldview derogation (paying less for foreign products) was found in the condition in which there was no worldview affirmation. This is in contrast with previous findings (e.g., Fransen, et al., 2008; Jonas et al., 2005). The authors explain this by the fact that they used fair-trade products as foreign products; buying fair-trade products can be perceived as ethically correct behavior. Since previous research showed that consumers are more willing to engage in ethical behavior (e.g., donating) after a mortality salience prime, the use of fair-trade products might be the reason for the null effects. No effects were found for willingness to pay for local brands (Sullivan et al., 2011).

Although previous research on self-affirmation and worldview defense outside the context of consumer behavior convincingly demonstrated that self-affirmation reduces worldview defense effects under conditions of

mortality salience (Schmeichel & Martens, 2005), only the study presented earlier examined affirmation in a consumer-related context. The results of the described study are promising but only showed decreased out-group derogation effects and no effect on in-group favoritism. A difference between the studies is that in the experiments of Schmeichel and Martens (2005), participants indicated which values are important for them and were subsequently affirmed on those values. Sullivan et al. (2011) used a more general affirmation by affirming one's culture. This may explain why the effects in the latter study are weaker, since not all people might feel affirmed by perceiving positive information about their culture; this might only be the case for people who identify strongly with their culture. It may therefore be interesting for future research to examine the role of self-affirmation processes in more detail. One could, for example, also study whether self-affirmation also reduces other mortality salience effects such as conspicuous consumption. Hence, self-affirmation might not only be suitable to reduce worldviews defense effects but also other types of consumer-related mortality salience effects.

MANIPULATING MORTALITY SALIENCE IN A CONSUMER CONTEXT

Most of the hundreds of empirical terror management studies are experimental and use a mortality salience manipulation that consists of two open-ended questions, where the participant is asked to "jot down" what happens when s/he dies (Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). Several researchers have noted that this is a rather artificial reminder of mortality salience (e.g., Pyszczynski, Solomon, & Greenberg, 2003) and gradually more forms of death reminders have been explored. Burke et al. (2010) conducted a meta-analysis on terror management research and made a distinction between four different mortality salience manipulations: standard essay questions, subliminal primes, survey questions about the fear of death, and other various media-related inductions (video, story, slide show, etc.). The meta-analysis showed that almost 80% of the studies used the standard essay questions. Subliminal primes were used in 4% of the studies, survey questions, such as the Fear of Personal Death Survey (Florian & Kravetz, 1983), were used in 7% of the studies, and 9% of the studies used another, more applied, mortality salience manipulation. The meta-analysis revealed no outcome differences between different manipulations, resulting in the authors' conclusion that vastly different death primes are equally capable of triggering terror management processes. The authors note: "This also suggests that some real-world death primes (e.g., passing a funeral home or cemetery or watching a death-related film) are likely to elicit effects similar in magnitude to the more contrived (i.e., write an essay) 'lab' mortality salience effects" (Burke et al., 2010, p. 182).

Considering that the effectiveness of real-world death primes is highly relevant to the world of consumer behavior and marketing communication, it is interesting to explore what types of manipulations are typically used in this context. An analysis on terror management studies in the domain of consumer behavior revealed that no less than one-third of these studies used applied mortality salience manipulations in a variety of forms, such as television programs or advertisements. When looking at the diversity of real-world manipulations used in studies within the consumer domain, we found that they usually are either embedded in news or television programming, or in some form of advertisement. This is an interesting distinction, as that first category makes use of real-world mortality cues we inevitably, but usually accidentally, see in the media, while in the second category mortality reminders are strategically tailored to affect consumers. At first sight, it might not seem desirable or ethical to increase existential anxiety by ads with the goal of selling products, but considering the effects mortality salience may have on product appeal, it seems logical that academics have examined the possibility.

Death reminders based on news or television programming seem unavoidable, since there is an increasingly visible level of death and dying around us, or as Hanusch states: "death, it seems, is the new black of the modern media age" (Hanusch, 2010, p. 2). Death is very much present on our television screens and in our newspapers. Estimates are that about one-third of television programming feature content related to death (DeSpelder & Strickland, 2002) and for newscasts that's even 40% of its coverage (Liu & Smeesters, 2010). Several studies have shown that death-related news or television programs can elicit death anxiety and in turn influence consumer behavior. For example, Dar-Nimrod (2012) used 10-minute clips showing the death of an infant from the television show Six Feet Under and showing someone shot to death from the movie The Deer Hunter to induce mortality salience. Control conditions consisted of similar clips, respectively from The West Wing and Forrest Gump. After theses clips, commercials for various well-known products (such as cars, computers, jeans) were shown. Results from both experiments indicated that the advertised products were more appealing after watching fear of death inducing television clips, compared to viewing neutral clips. In a similar fashion, Liu and Smeesters (2010) studied how death-related media contexts affect consumer preferences for domestic and foreign brands. They used a few different mortality salience manipulations consisting of newsclips about the 9/11 terrorism attack (Experiments 1 and 3) and a fatal plane crash (Experiment 2), which resulted in consumer-related defense behavior (preference for domestic above foreign brands). Similar results were found by Rangan et al. (2015) who showed that exposure to death-related television programming led to differential evaluation of domestic and foreign advertisements. Their mortality salience prime consisted of a 5-minute local broadcasted newsclip, of which the last 1.5 minutes

covered death-related content, such as crimes and fatalities in the neighborhood. Analysis showed that watching a death-related news report led to greater death thought accessibility and affected the evaluation of advertisements, but only when ads were shown after a death-related newsclip; there was no effect when the advertisements were shown before the death-related newsclip.

These studies suggest that death in the news or on television can function as a powerful mortality reminder that subsequently affects consumer behavior in several ways. But where the media can accidentally evoke existential anxiety, it can also be purposely used with the specific intent to influence consumers. One way to do so is with subliminal or supraliminal cues. Fransen and colleagues, for example, have demonstrated that exposure to a funeral-insurance brand can induce mortality salience, which in turn can lead to increased spending intentions, higher charity donations, and a greater appeal of domestic products (Fransen et al., 2008). Similar to this, Chopik and Edelstein (2014) induced existential anxiety by a banner ad that read, "Join Us for UM's Day of the Dead Celebration on Nov. 2nd!!!" with a picture of a skull; the control condition featured banner ads that read, "Join Us for UM's Cherry Picking Outing on Aug. 5th!!!" with a picture of cherries. In four experiments it was demonstrated that a simple banner can indeed function as a mortality reminder that results in various defensive behaviors. Participants in the mortality salience conditions were willing to spend more money on luxury products and this relationship was mediated by death-thought accessibility.

Mortality salience can be induced by (news)media and specific brands and may influence consumer behavior. But mortality reminders can also be deliberately used in advertising to directly affect consumer responses; there is even a term for this—necromarketing: the marketing of death. It is a marketing strategy that explicitly or implicitly references death to create an immediate connection between the brand and the consumer (Wojciechowski & Shelton, 2014). Shelton (2016) conducted a content analysis of American television advertisements to discover whether and to what extent necromarketing is actually used. She found that 13% of all analyzed advertisements used necromarketing, which seems a substantial amount for such a specific marketing strategy. The question is of course, does it work; can an advertisement elicit death anxiety and affect consumers?

Gale (2014) conducted a qualitative study to investigate the emotions that are evoked by existing print advertisements with death representations in them. She used projective interviewing techniques to understand a broader range of unconscious emotions evoked by the ads. Results revealed that the ads evoked death anxiety among 90% of the participants. The most dominant initial response to the ads was aversion: participants stated that they didn't like the ad and couldn't imagine that this strategy would help selling the product. Next to that, participants with high materialistic tendencies

experienced feelings of discomfort, confusion, fear, and worry. This suggests that existing death-related advertisements indeed induce death anxiety, which seems to result in negative evaluations of these ads. However, this study did not focus on the effects these types of ads may have on consumer responses toward the advertised brand.

Das et al. (2014) did investigate effects of existential anxiety inducing advertisements. They created several advertisements, for various products, containing a death reminder. In Experiment 1, they created an ad for a national newspaper subscription that featured a death-related article and a picture of a coffin on the front page of the newspaper. They also used a second ad for an art library with an artwork depicting a skull on it. For their second experiment, they used an ad for a fictional newspaper, showing an interactive tombstone. Participants filled in their name and age at the beginning of the survey, which was projected on the tombstone with the date that they would die (3 days away from the experiment). In the third experiment, they used an ad for a soda drink, depicting a tombstone and the slogan "How long do you want to wait? Enjoy it while you can!"). The results showed that all of the different mortality salience advertisements increased death-related thoughts, which in turn resulted in increased purchase intentions of the advertised products. These effects occurred regardless of participants' affect and attitude toward the ad. In the second experiment, for example, after seeing the mortality salience inducing advertisement, respondents reported a more negative mood overall, but also a more positive attitude toward the ad. Overall, scholars reckon that the presence of death references in a commercial setting doesn't necessarily lead to negative emotion, since sometimes death is used in humorous ways, or because certain death symbols, such as a skeleton or personified death, are not automatically considered negative or threatening (Wojciechowski & Shelton, 2014).

Overall, it seems that within the consumer domain a variety of mortality salience manipulations are able to induce death reminders that in turn affect worldview defense behaviors and materialistic tendencies. Researchers stepped away from the rather artificial death reminder induced by essay questions and showed that a more applied form of mortality salience inductions can even be purposefully used to sell products and strengthen brand connections. This opens the way for effective death-related advertising, or as Das and colleagues state: "mortality reminders in advertising create killer ads" (Das et al., 2014, p. 837).

FUTURE AVENUES TO EXPLORE MORTALITY SALIENCE EFFECTS IN CONSUMER BEHAVIOR

Based on the presented overview of terror management studies, we can conclude that existential concerns about death play an important role in explaining various forms of consumer behavior. We observed that mortality salience

may increase the "urge to splurge" (Arndt et al., 2004) and affects specific consumer preferences under certain circumstances. Moreover, consumer behavior researchers proved to be quite creative in using mortality salience manipulations pertaining to the real world, making the observed results even more relevant in explaining consumer behavior. However, the overview also revealed several shortcomings and gaps in the literature.

The cultural dimension of worldviews. We notice a lack of research on individual and cultural differences in worldviews and also on the potential change in worldviews. Theoretically, one could argue that worldviews become more salient when consumers are reminded of their mortality. In the majority of terror management studies in the consumer domain, it is assumed that consumers particularly in the Western world have a materialistic worldview and (when mortality is salient) can boost their self-esteem by living up to these standards through conspicuous consumption and buying luxurious products. On the other hand, empirical studies observed that after a mortality salience prime, people donated more money to charity, which conflicts with the dominant worldview of acquiring more money and wealth for the self. These results seem to indicate that people may hold different, but also various worldview values simultaneously. It remains, however, unclear how these different worldviews affect consumer behavior and what factors determine the worldview that is activated after a death-related prime. Magee and Kalyanaraman (2009) argued "it is important to note that mortality salience does not lead one to bolster a particular *type* of worldview. Mortality salience leads a person to bolster one's own worldview, whatever that happens to be" (p. 176). This is interesting considering that consumers have several worldviews and their influences in any particular situation are dynamic and might depend on the cues that activate their accessibility. This means that mortality salience mostly has a polarizing effect on the most dominant worldview that is activated when confronted with death. Magee and Kalyanaraman (2009) found evidence to support this notion by demonstrating that mortality salience strengthened the effects of an active dominant worldview on persuasive effects. Moreover, even though Maheswaran and Agrawal (2004) argued that mortality salience effects on consumer behavior might differ in various cultures, e.g., individualist versus collectivist cultures, we found no research in the consumer domain testing these assumptions. In fact, most studies on the effects of mortality salience on consumer behavior are conducted in the Western world making it difficult to draw conclusions on potential differences between cultures. Although the notions above actually align with the propositions of TMT, it is noticeable that they have received scant empirical attention. Especially in the domain of consumer behavior, it seems important to investigate the differences in worldviews, since there are probably abundant differences between subgroups that have an effect on consumer behavior. For example, the currently growing movement toward anticonsumerism and the relatively quick rising of certain

subcultures with very specific preferences for brand and products (e.g., hipsters) may pervade a suitable context to study the dynamic influence of worldview differences in terror management effects.

Death, life, and the unbearable lightness of being. It is interesting to note that terror management research in the consumer domain has brought to the fore several alternative mortality salience manipulations that can decrease the effects of a fear of death on materialistic preferences, such as transcendence management (Cozzolino et al., 2004), mortality salience of a loved one (Wang, 2014), and life salience (Arendsen & Das, 2006). Although we can only speculate as to why this is the case in this particular context, one reason might be that the consumer domain underscores the unbearable lightness of human existence, showing support for the sometimes tragic or at least awkward strategies people select to deal with the human condition, such as increased greed or finding value in glitter and gold.

Wang (2014) found some preliminary support that, although the fear of one's own death may increase materialistic tendencies, clinging to material possessions does not soothe the fear of losing a close loved one. Theoretically, this makes sense in at least two different ways. First, although shopping may bring (the idea of) value to individual consumers, it cannot bring back a loved one. Second, on the most fundamental level, holding on to material possessions may intensify, rather than suppress, the fear of losing a loved one because of the fact that the human body is also made up of materials that will eventually decay. Other, more spiritual, cognitive worldviews such as the belief in an afterlife may be better suited as an anxiety buffer in such cases. Also intriguing are the findings from a study that experimentally simulated near-death experiences and compared the effects to prototypical mortality salience effects. Research among people who had near-death experiences suggested that these experiences may not only increase individuals' acceptance of their mortality (Greyson and Bush, 1992; Ring, 1980), but also increase perceived meaning in life (Noyes, 1980). The findings of the experimental study that used an experimental near-death experience simulation labeled "death reflection" provided some preliminary evidence that, whereas reflecting on the fact that one will die at one point in time increases greed, reflecting on death in a very specific and intense way decreased greed, and promoted openness to unfamiliar worldviews, growth, and self-actualization (Cozzolino et al., 2004).

If we regard near-death experiences as a narrow yet successful escape toward life away from death, transcendence management may represent a conceptual bridge between death salience and life salience (i.e., living life to the fullest). Does living a full life obliterate the need to find refuge in material possessions and consumption? Preliminary evidence indeed suggests that strong reminders of life, such as a human baby, may indeed decrease consumerism. Specifically, Arendsen and Das (2006) found that participants who were exposed to a baby scored lower on a death-thought accessibility

measure (see Chapter 4, this volume), higher on a life salience measure, and showed less impulsive buying and eating behavior than participants in the control or mortality salience conditions. This is particularly interesting when considering that many advertisements appeal to getting the most out of life (e.g., live life to the max) to sell their products. This may, however, backfire for marketers if reminding people of life turns them away from consumption. On the other hand, it could be argued that the salience of life and death go hand in hand, making it interesting to further examine how they are interrelated and how and when they affect worldview bolstering in various consumer contexts.

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Chapter 21

Legal Applications of Terror Management Theory

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TERROR MANAGEMENT THEORY

Terror management theory (TMT) posits that humans are unique creatures in terms of our extensive cognitive resources. Our complex cognitive ability has many benefits including a capacity for self-awareness and symbolic thought. However, a by-product of this cognitive sophistication is an awareness of the finite nature of our existence, and our inevitable mortality. This creates a potentially tremendous anxiety-based conflict in humans—we have a biological predisposition for survival, yet our own mortality cannot be controlled. To manage this existential anxiety, we invest ourselves into a world of value and meaning. This allows us to participate in a cultural experience that provides psychological comfort through self-esteem enhancement derived from achieving and surpassing cultural standards of value, and through the promise of either a literal or symbolic immortality. A substantial amount of TMT research demonstrates that one's beliefs, generated from the culture one embeds themselves in (i.e., cultural worldview), and one's quest for personal meaning and significance within one's worldview, help alleviate and reduce existential anxieties. Because culturally derived worldviews are merely social constructs, we need to be surrounded by others who will reinforce our beliefs, because they share similar views about the significance of our accomplishments and behaviors (Greenberg, Pyszczynski, & Solomon, 1986). Therefore, when people are reminded of their own mortality, they become more positive and supportive of others who share their values and beliefs, and more negative toward those who pose a threat to their worldview (Greenberg, Solomon, & Arndt, 2008). When confronted with a worldview threatening other, people become highly motivated to defend their respective worldview by affirming its legitimacy and superiority. Worldview defense can take several forms including *derogation* (i.e., verbally belittling the threat), *assimilation* (i.e., attempting to convince worldview threatening

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others to adopt one's belief system), *accommodation* (i.e., shifting one's belief system slightly to incorporate some elements of a threatening worldview), and the most extreme form, *annihilation* (i.e., attempting to use violence to eradicate worldview threats) (Becker, 1973; Hayes, Schimel, Arndt, & Faucher, 2010; Greenberg et al., 2008; Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004).

The basic principles of TMT have been explored through the application of the *mortality salience* (MS) paradigm (see Chapters 1 and 4, this volume), which involves subtly reminding individuals of their own death and examining the effects on behavior and attitudes in comparison to another unpleasant control topic. Within this research, MS has been shown to intensify an individual's attempts to associate with, live up to, and defend his or her own cultural worldview. To date, these findings have been obtained in over 400 empirical studies (Burke, Martens, & Faucher, 2010; Pyszczynski, Solomon, & Greenberg, 2015).

The Relationship Between Morality and Legality

From a TMT perspective, awareness of death creates a need to establish and adhere to culturally defined moral behaviors, as we invest in and defend our cultural worldviews. This may occur in the form of living up to moral or legal standards of value. Legality and morality both channel and guide individual behavior and represent formal and informal methods of social control; i.e., they are regulators of human conduct. Laws, which are formal and explicit means of social control, embody the legal rules set forth in society that define unacceptable behavior and the consequences of legal disobedience. Behaviors that are legally forbidden may already be acts that individuals refrain from engaging in due to their belief system (e.g., stealing from someone). When we act in accordance with moral rules, we feel virtuous and may be praised by others, while conversely, when we violate moral standards, we may feel guilt and others may dislike and disapprove of our behavior (Shavell, 2002). Thus morality reflects a more informal approach to social control where universal values are adopted that influence and guide behavior.

However, morality may not always fully regulate behavior in consistent ways within a society. This may occur because cultural worldviews are subjective social constructions, and some individuals may possess worldviews that value engaging in highly self-motivated actions (e.g., taking anything one wants to fulfill material desires, or acting aggressively to demonstrate the culturally valued attribute of strength) that may have harmful consequences for others. Thus laws are imposed to provide regulation of behaviors typically consistent with the worldviews of a majority of citizens. Laws guide our behavior, may serve to alter our moral beliefs, and largely exist to regulate morality (Shavell, 2002).

Although our cultural worldviews are generally developed by the values and social constructs set forth in society, standards regarding morality and behavior may be shaped by legal rules. For example, there may be opposing views on the morality of certain acts, such as sexuality or drug use, but in the end, the law determines whether behavior is permissible or not within a society. This may lead an individual to refrain from engaging in a behavior one does not see as morally wrong (e.g., seeking the services of a prostitute). Thus, in some cases, laws may supersede morality. However, in other instances, an individual may know an act is illegal, but may not feel that it is a moral transgression, and may engage in that behavior (e.g., recreational drug use).

From a worldview defense standpoint, when we are reminded of our mortality, we need both legal and moral guidance to know what actions we can take to assuage our fears about death. That is, laws dictate what form of worldview defense may be appropriate to utilize (e.g., criticism and derogation of worldview threating others, as opposed to committing violent acts against them). Ultimately, the legal system serves as a mechanism to control and punish immoral behavior. Consequently, there are rich connections between TMT and legal issues. However, the TMT–legal relationship has been shown to be complex at times and broad in nature (Arndt, Lieberman, Cook, & Solomon, 2005). To that end, MS has been found to influence many aspects related to the commission, prosecution, and punishment of offenses.

COMMISSION OF OFFENSES

Perhaps the clearest example of worldview defensive reactions with legal implications is violent terrorist attacks (see also Chapter 20, this volume). Events such as the September 11th attacks, the Boston Marathon bombing, the Charlie Hebdo office, and Bataclan Theater attacks in Paris, and, more recently, the Manchester Arena bombing in May 2017 exemplify illegal behavior generated by worldview defensive responses. These attacks appear to be often driven by individuals' sense that they must defend themselves, their people, their culture, and/or their religion against worldview threats (Lifton, Schulz, & Sullivan, 2003; Richardson, 2006). Indeed, humiliation, domination, and injustice are often cited as the underlying mechanisms that prompt extreme violence, particularly terrorist acts (Richardson, 2006; Stern, 2003). For example, under conditions of MS, Iranian participants increased support for killing Americans through martyrdom (Pyszczynski et al., 2006). In addition, individuals reminded of their mortality have been shown to express greater support for violent opposition toward others who pose an ideological threat (Hirschberger & Ein-Dor, 2006). Aggressive responses (e.g., allocation of excessive amounts of hot sauce) that could potentially

cause significant physical harm to worldview threatening targets have also been elicited in the context of laboratory situations (McGregor et al., 1998).

Further, violence appears to be a condoned response to terrorism (Weise et al., 2008), representing an escalating scale of aggression between opposing worldviews. To that end, MS has been shown to motivate conservative participants to express increased support for the utilization of extreme military tactics to combat terrorism, even though innocent people may be killed in the process (Landau, Solomon, et al., 2004).

Violent behavior may not only be the product of conflicting worldviews, but also a way of enhancing self-esteem on the part of the offender. For example, sexual violence may provide an offender with a sense of power and control that may compensate for feelings of inadequacy, vulnerability, and low self-esteem (Cowan & Mills, 2004; Marshall & Marshall, 2000). In this vein, following MS reminders, men who have been primed with sexually oriented thoughts show greater tolerance for aggression against women (Landau et al., 2006). Similarly, domestic violence may be the product, in part, of a person's need to enhance his or her self-esteem by exerting domination over his or her partner (Brown, 2004; Coleman, 1980). Indeed, abusive husbands have been shown to have lower levels of self-esteem, and experience more self-esteem damaging marital situations than nonabusive husbands (Goldstein & Rosenbaum, 1985; Shackelford, 2001).

Self-esteem may also be enhanced, for some, by engaging in other illegal activities. For example, MS increases willingness to engage in recreational drug use (Hirschberger, Florian, Mikulincer, Goldenberg, & Pyszczynski, 2002; Nagar & Rabinovitz, 2015), drive drunk (Shehryar & Hunt, 2005), among individuals who derive self-esteem from these behaviors. In addition, MS increases risky and reckless driving among individuals whose self-esteem is connected to their driving skills (Ben-Ari, Florian, & Mikulincer, 1999). Thus it appears that MS may produce violent and/or prohibited behaviors for multiple reasons, including as a self-esteem enhancement tactic, or as a worldview defensive reaction. However, within the legal context, the effects of MS are not limited to the commission of crimes by an offender. Rather, they are also applicable to perceptions of offenders and legal judgments.

MS AND LEGAL DECISION-MAKING

Awareness of Death and Judgments of Offenders

A growing body of research has explored how, and to what extent, MS influences individuals' judgments and responses toward defendants. This growing body of research largely developed from the seminal work by Rosenblatt, Greenberg, Solomon, Pyszczynski, and Lyon (1989), which was the first experimental study to examine TMT within the courtroom. The research

focused on the impact of MS on judicial decisions, using a sample of municipal court judges presented with information about an accused criminal offender (i.e., a prostitute). Judges were chosen because they provided a highly stringent test of the MS hypothesis, as they are trained to be impartial decision makers. Presumably, the prostitute represented a worldview threat to the judges, as the offender had violated the standards of acceptable behavior codified by the legal system that they have a professional duty to uphold. It was expected that judges who were reminded of their own death would have stronger negative reactions to the worldview-violating offender. Following the MS manipulation, judges were presented with information on the arrest of an alleged prostitute and were asked to set bail in the case. Judges who received the MS manipulation assigned, on average, $450 bail, which was significantly higher than those in the control condition, who assigned an average of $50 bail. In a follow-up study (Rosenblatt et al., 1989; Study 2), the researchers extended these findings by demonstrating that the hyperpunitive reactions to the prostitute only emerged among individuals who possessed negative views about prostitution, presumably because the offender would not represent a worldview threat to those with pro-prostitution beliefs.

Although the initial Rosenblatt et al. (1989) findings indicated that individuals have a hyperpunitive reaction to lawbreakers, subsequent research exploring the relationship between MS and legal judgments has produced a more nuanced view of this topic. For example, the connection between legal judgments and MS has been explored within the context of relationship needs and attachments (Mikulincer & Florian, 2000) and symbolic immortality (Florian & Mikulincer, 1998). Within these studies, MS led to increased punitive judgments of offenders for different types of charges and legal accusations (e.g., robbery, fraud, medical malpractice, and assault). However, the results also indicated that the effects of MS on punitive judgments were largely dependent upon a number of situational factors and individual differences (see Arndt et al., 2005). Most notably, those who had more secure relational attachments, and stronger means for managing death-related thoughts, were not influenced by death-related manipulations. Those who were less protected from mortality concerns, in contrast, evidenced increased punitive responses.

Additionally, although a general tendency exists for mortality-based cognitions to produce greater punitive judgments and harsher reactions toward alleged offenders across a variety of criminal offenses, research has also demonstrated that, in some cases, MS will produce leniency toward offenders (Arndt et al., 2005). That is, because defendants have broken the law, they typically represent a worldview threat to individuals. However, in some cases the victim themselves may also represent a worldview threat, if they possess characteristics that challenge the cultural worldview of others. Indeed the victim's possession of those characteristics may have been the sole basis of

an attack against him or her. Such is the case with bias-motivated hate crime attacks.

Empirical support for this possibility was demonstrated by Lieberman, Arndt, Personius, and Cook (2001), who presented descriptions of biased motivated attacks on the basis of religion (i.e., anti-Semitic) or sexual orientation (i.e., anti-homosexual) to a group of non-Jewish participants who were not supportive of homosexuality (consequently, the victims represented worldview threats to participants). In a control condition, no motivation for the attack was provided. The participants were exposed to MS or not before reading the descriptions of the attack. The results indicated that although non-MS participants were more punitive toward hate crime offenders, MS participants were more lenient to them, compared to an attack where the motivation of the offender was ambiguous. Similarly, Greenberg, Schimel, Martens, Solomon, and Pyszczynski (2001) found that White MS participants were more tolerant than control participants of racist comments made by a White supremacist.

Thus it appears that MS may increase or decrease punitive reactions to lawbreakers depending upon the nature of a case, attitudes toward the crime involved, and individual differences that may exert a moderating effect, such as attachment style. However, additional research indicates that MS not only impacts the outcome of legal judgments for defendants, but also activates concerns with defendants' ability to receive fair treatment within the legal system.

Procedural Fairness Concerns

Van den Bos and Miedema (2000) explored the relationship between MS and fair process concerns by focusing on individuals' behavior regarding the distribution of awards. Following an MS manipulation, participants were either allowed or not allowed to express their opinion regarding appropriate distribution and amount of awards for a task that they and another individual completed independently, but equally well. Participants who were allowed to recommend award distributions suggested doing so evenly in both the MS and control conditions. This demonstrates a belief and desire for fair and balanced rewards for equal work and performance. However, MS participants showed less negative reactions and more positive feelings (compared to participants in the control conditions) when they were allowed to express their opinions. The results suggest that death-related thoughts motivate individuals to seek a fair distribution of rewards and a fair decision-making process.

The issue of treating individuals fairly within a legal setting has been explored in the context of juror compliance to judicial admonitions. During the course of a trial, jurors may be instructed by a presiding judge to ignore particular testimony and abstain from using it within their decision-making process. Typically, jurors are unable or unwilling to adhere to judicial

admonitions, and often end up paying more attention to the testimony after it is ruled inadmissible. This phenomenon has been termed the "backfire effect" (Wolf & Montgomery, 1977). Of course, under these circumstances, jurors' attention to the inadmissible testimony and evidence, and the eventual consideration of that evidence, threatens an offender's right to a fair trial. However, because beliefs about fairness, impartiality, and the importance of upholding the law appear to be important worldview components for many people (e.g., Rosenblatt et al., 1989; Van den Bos & Miedema, 2000), the activation of MS has the potential to increase adherence to judicial instructions, if those instructions (and underlying legal rules) are designed to provide fair treatment for the defendant. Thus MS may ameliorate the "backfire effect" by motivating jurors to rely on their own personal beliefs about fairness and justice, that can then be exercised by obeying judicial instructions to ignore admissible evidence (ultimately increasing trial fairness). This possibility was supported in research by Cook, Arndt, and Lieberman (2004), who found that following an MS manipulation, mock jurors were more likely to adhere to admonitions to ignore inadmissible information when they were encouraged to rely on their personal beliefs about justice and law. Similar results were obtained by selecting jurors who had a natural inclination (identified through personality measures) to rely on their personal beliefs about justice, as well.

However, there may ultimately be limits to the extent that individuals embrace fair process concerns with respect to worldview violators. For example, in a study that explored judgments about the appropriate procedural protections for a terror suspect, under conditions of MS, suspects who were either American or were from a neutral foreign country received recommendations for better treatment during detainment, compared to individuals who were Saudi Arabian (Kugler & Cooper, 2010). Thus the connection between mortality reminders and legal judgments may depend on an individual's sense of justice and fairness, as well as characteristics of the defendant, which highlights the complex relationship between legal decision-making and MS.

Jury Selection and Trial Strategy

TMT can provide a useful approach for attorneys in regard to selecting jurors, developing trial strategies, and presenting evidence. Because individual differences have been shown to moderate reminders of death, personality and sociodemographic factors can be identified through juror questioning (assuming the trial is in a jurisdiction where this is permitted, as in some jurisdictions, and in Federal courts, the judge may question the jurors). Lawyers may want to use the voir dire (i.e., jury selection) process to question and exclude jurors who have personality factors that potentially strengthen MS effects, or emphasize evidence, testimony, and facts during the trial that

could increase MS among jurors. For example, personality factors such as authoritarianism and just-world beliefs (Altemeyer, 1981; Rubin & Peplau, 1975) may be relevant characteristics to consider within a TMT framework (Greenberg et al., 1990).

Individuals scoring high on the dimension of authoritarianism tend to possess strong beliefs in obeying the law and maintaining order, and therefore react in a highly negative way to individuals who violate moral or legal standards (Lamberth, Krieger, & Shay, 1982; Lieberman & Sales, 2007). In addition, people who are inclined to view the world as a just and orderly place tend to be more conviction prone, because they are highly motivated to hold individuals accountable when negative events have befallen a victim. From this perspective, jurors are more likely to perceive criminal defendants who pose a threat, or who violate their worldview, in particularly negative ways, and ultimately impose harsher punishments on them, compared to defendants who share similar views and beliefs. Previous research supports this notion that death reminders influence participants' preferences for just-world belief interpretations of information (Landau et al., 2004). Thus a variety of personality factors may influence jurors' verdicts (see Lieberman & Sales, 2007 for a more complete discussion of juror personality characteristics).

In addition, manipulating rational or emotional factors during a trial may suppress or intensify MS effects. Research by Simon et al. (1997) indicates that MS effects are more likely to be activated when individuals manage information in an emotional, gut-level, experiential manner, as opposed to a more rational, analytic, and deliberate manner. Consistent with this perspective, the presentation of emotionally oriented exhibits and/or testimony may serve to trigger experiential processing (Lieberman, 2002). Conversely, attorneys should seek ways of increasing rational processing among jurors if they are eager to reduce the impact of MS effects. This type of processing mode may be achieved through the presentation of statistical information, or by encouraging jurors to be careful and deliberate in their consideration of case materials, while simultaneously avoiding testimony and exhibits designed to produce strong emotional reactions.

Death Reminders in the Courtroom

Thoughts about mortality and death can be implicitly activated and made salient to jurors through numerous facets of a trial. For example, mortality-related thoughts may become salient to jurors through the nature of specific criminal charges such homicide, negligent homicide, or manslaughter, all of which possess the potential to be a reminder of one's own death. Further, death-related cognitions may become salient through witnesses testimony, or attorney statements, or as a function of participating in the sentencing phase of a capital murder trial.

In addition, reminders of death that occur outside of conscious awareness may produce worldview defense for individuals (see Martens, Burke, Schimel, & Faucher, 2011 for a meta-analytic review). Within a legal context, research demonstrates that subtle reminders of death, such as viewing a fatal car accident, can motivate individuals to defend their cultural worldview. For example, in an experimental study by Nelson, Moore, Olivetti, and Scott (1997), researchers presented individuals with a civil liability case where an auto-manufacturer was being sued over defective brakes. The auto company was either a Japanese or an American manufacturer and participants were presented with video of a fatal car accident, a subtle reminder of death. Results demonstrated that the American auto-manufacturers received more favorable judgments compared to a foreign Japanese auto-manufacturer.

Death-related events may, of course, also occur outside the courtroom, nonetheless, be highly impactful upon legal decision makers. For example, massive societal MS was undoubtedly generated in the United States by the September 11, 2001, terrorist attacks. Within the legal arena, TMT predicts that fatal events along these lines can produce strong worldview defensive reactions (Pyszczynski, Solomon, & Greenberg, 2003). Consequently, in the context of mass causality events (or other instances involving death or fear of death), we would expect to see more severe verdicts and sentences rendered by juries and judges. This may be especially relevant in the mass murder era we currently live in where news reports of terrorist attacks and mass killings (e.g., school or workplace shootings) have increased, and reinforce concerns regarding one's own vulnerability due to the unpredictability of these events.

Death Penalty Decision-Making

Capital punishment trials are arguably the legal setting where reminders of mortality are most pronounced. These trials are focused on the death of a victim and the potential death of an alleged offender (Judges, 1999; Kirchmeier, 2008; Lieberman, Shoemaker, & Krauss, 2014). Within this context, jurors may contemplate death internally by reflecting upon their personal mortality, or externally with regard to the defendant or victim. TMT research within this context demonstrates that the effects of MS are more evident when individuals think about their own death rather than the death of others (Greenberg, Pyszczynski, Solomon, & Breus, 1994; Nelson et al., 1997). For example, in two studies, Lieberman et al. (2014) examined self-focused mortality versus other-concentrated mortality on juror reactions to aggravating and mitigating factors. Aggravating factors are circumstances about the crime, that if found to be true, make a sentence of death appropriate. Conversely, mitigating factors are conditions that if found to be true, make a sentence of life imprisonment appropriate.

Within both studies by Lieberman et al. (2014), all participants were presented with case evidence that included death-related components (i.e., evidence about the victim's death and consideration of the death penalty). However, in the experimental condition, mock jurors were also asked to think about their own death, which required participants to engage in a dual focus of mortality (i.e., a focus on (1) the death of the victim or potential death of the defendant and (2) one's own death). Study 1 manipulated the strength of aggravating factors. The results indicated that dual-focused MS participants were more influenced by the strength of aggravating factors and more likely to sentence the defendant to death when exposed to strong aggravating factors, than participants exposed only to trial-based death reminders. Mitigating factor strength was manipulated in Study 2, and dual-focused MS mock jurors were more likely to deliver a life imprisonment sentence. The effect of self-focused mortality was limited, however, to participants who had a high degree of comprehension of the jury instructions that included information and clarification of mitigating factors. Lieberman et al. (2014) argued that the research provides further evidence that the relationship between legal decision-making and death-related cognition is complex and may often be heavily influenced by procedural fairness concerns, such as appropriately weighing evidence or aggravating and mitigating factors.

Bandt-Law and Krauss (2016) extended these findings by examining jurors' decisions regarding severely mentally ill defendants in capital punishment trials. Consistent with the approach of Lieberman et al. (2014), participants were asked to specifically think about their own death, in addition to reminders of death generated by the context of capital trial, or were only exposed to the trial generated reminders. In addition, they were either told that the defendant was severely mentally ill or not. When no mention of mental illness was made, MS participants demonstrated a hyperpunitive response to the defendant, consistent with the basic finding of Rosenblatt et al. (1989). However, when the defendant was described as being severely mentally ill, self-focused MS participants were more lenient to the defendant, than participants exposed to only trial focused death reminders.

Thus once again we see a very nuanced relationship between MS and legal judgments. Although MS participants can be highly punitive in the absence of contextual factors that encourage procedural fairness, behavior was significantly altered through the introduction of a mitigating factor (i.e., the defendant's mental illness). Interestingly, participants were not explicitly told mental illness was a mitigating factor, or how to use that information. Rather, self-focused MS jurors appeared to innately use the characteristic in this way. This tendency may reflect the important role fairness plays in one's cultural worldviews. It may be beneficial to identify other defendant characteristics (e.g., youth or mental retardation) that elicit fairness or compassionate responses when self-focused mortality reminders are present. In addition, it is interesting to note that the reaction of self-focused MS

participants presented with a mentally ill individual was not highly negative, and that this reaction deviates from the concerns MS participants in other studies have demonstrated with regard to the corporeality of the body (see Chapter 9, this volume). It may be useful for future research to examine the impact of MS on perceptions of mental health, as mental health issues are relevant in a wide range of legal contexts, such as the insanity defense, competency evaluations, and comprehension of legal rights.

CURRENT CULTURAL CRIMINAL JUSTICE ISSUES

TMT is useful for not only understanding the general influence of MS on offender motivations, and the judgments of legal decision makers, but also provides a very useful framework for understanding the psychological underpinnings of several current issues of national importance. In this section, we focus on illegal immigration, and conflict between police and the community within the context of the police-related deaths of unarmed civilians, and the rise of the *Black Lives Matter* movement.

Illegal Immigration

The issue of illegal immigration has become a topic of major national importance under the campaign and Presidency of Donald Trump. For example, during the campaign, President Trump repeatedly emphasized the criminal activity of illegal aliens stating that they were disproportionally more likely to commit crimes (e.g., Nakamura, 2017), and quickly implemented executive orders that allowed for greater deportation of illegal immigrants, and the construction of a border wall to prevent illegal entry into the United States (Ahmed, 2017; Exec. Order No. 13767, 82 Federal Register 8793).

Based on the TMT literature, native residents may perceive immigrants as a direct challenge to their cultural worldviews and beliefs and a direct threat to their safety, security, and well-being, if they perceive immigrants are taking their jobs, putting a strain on the workforce, and are likely to commit serious crimes. By possessing negative beliefs toward an out-group and projecting these feelings through out-group derogation, the superiority of the in-group's worldview is demonstrated, self-esteem may be enhanced, and existential anxiety reduced (Bassett, 2010; Niesta, Fritsche, & Jonas, 2008). Thus because our cultural worldviews safeguard us against existential anxiety, and immigrants are perceived to be a direct threat to that buffer, MS should intensify expressions of negative perceptions and behavior toward immigrants among nonimmigrant citizens.

Bassett and Connelly (2011) explored these assumptions by randomly assigning individuals to either an MS condition or a control condition and having individuals read one of two vignettes describing an immigrant who illegally came to the United States without required legal documents. The

only difference between the two vignettes was the immigrant's name and country of origin. In one passage, the immigrant was named Ben Johnson, an individual who came to the United States from Vancouver, Canada. In the other passage, the individual was named Carlos Suarez who emigrated from Mexico City, Mexico. Participants were then asked to indicate whether they believed immigrants threaten US national security, put a strain on the US welfare system, whether immigrants take jobs away from US citizens, whether immigrants should be allowed to stay in the United States, and whether children of immigrants are entitled to a US education. The results demonstrated an interaction between MS and the target immigrant. Under conditions of MS, more negative attitudes were exhibited toward the Mexican immigrant compared to the control condition. There were no significant differences between the MS and control conditions for the Canadian target. Presumably, this was the result of participants (who appear to have been drawn from a United States university) perceiving the Canadian immigrant as being more similar to themselves based on racial or cultural factors, and perceiving greater difference between themselves and the Mexican immigrant target, thus increasing his out-group (and worldview violator) status relative to the Canadian target. The researchers concluded that MS intensified negative reactions toward dissimilar individuals, specifically that negative reactions function as a worldview defense toward undocumented immigrants from Mexico. These findings build upon previous research demonstrating antiimmigrant bias within the context of California's Proposition 187, an unenforced 1994 policy that denied undocumented immigrants in California all public benefits like education and welfare, except for emergency medical care (Lee & Ottati, 2002).

Additional research explicitly examining the nexus of TMT and immigration has found that individuals who have rigid authoritarian views, or who have high scores on right-wing authoritarian (RWA) measures, have greater negativity and dislike for immigrants. RWAs and those who score high on authoritarian measures have historically exhibited greater prejudice toward diverse and dissimilar others, particularly immigrants (Altemeyer, 1981; Ommundsen & Larsen, 1997; Quinton, Cowan, & Watson, 1996). Under conditions of MS, authoritarians and RWAs expressed a significantly lower liking of immigrants and more overall negative perceptions of immigrants (Bassett, 2010; Weise, Arciszewski, Verlhiac, Pyszczynski, & Greenberg, 2012). Conversely, individuals who scored low on RWA measures and who value tolerance and open-mindedness viewed immigrants more positively (Weise et al., 2012). These findings were obtained for both American and French university students and are similar to other authoritarian effects in the TMT literature (e.g., Greenberg et al., 1990).

Ultimately, intolerance toward immigrants is likely to emerge when a nationalistic social identity is salient to an individual. Thus in the context of immigration, fellow citizens born in the United States may be perceived as

in-group members. However, social identities are highly flexible and context dependent. Consequently, outside the realm of an immigration discussion, many individuals may categorize fellow citizens as out-group members, and even the most trivial of distinctions may lead to a classification of in-group and out-group membership (Tajfel, 1974; Tajfel & Turner, 1979). This distinction, and subsequent intergroup conflict, may be exacerbated by MS (Harmon-Jones, Greenberg, Solomon, & Simon, 1996). Within criminal justice settings, in-group–out-group conflict has been highly apparent in the rise of the *Black Lives Matter* movement.

Black Lives Matter

Recent years have seen numerous high-profile incidents of police shootings of unarmed suspects, or other deaths in custody where accusations of excessive force are made against officers. For example, the shooting of Michael Brown in Ferguson, Missouri (McLaughlin, 2017), the choking of Eric Garner in New York City (Baker, Goodman, & Mueller, 2017), and the death of Freddie Grey in Baltimore (BBC, 2016), have led to the rise of the *Black Lives Matter* movement and highlighted the tension between police and citizens in communities. Given the fact that these incidents reflect examples of intergroup conflict that are centrally focused around mortality issues, they are inherently related to TMT. Maskaly and Donner (2015) have recently examined the relationship between TMT and police shootings of unarmed suspects. They argue that the integration of TMT and social learning theory (Akers, 2011) may provide a more complete explanation for these shootings.

According to Maskaly and Donner (2015), police and other law enforcement officers create a well-defined subculture. This subculture is transmitted to new officers and reinforced through rewards for adopting expected behavior, by emphasizing a "powerful 'us vs. them' mentality" (p. 209). This mind-set fosters a sense of isolation from civilians, through formal field training, which leads officers to be criticized, or even fired, for not exhibiting appropriate demeanor and behavior. Consequently, through the process of formal training and informal social learning, individuals are transformed into members of a subculture that is inclined to view out-groups with suspicion and distrust, and behave in an authoritative manner toward them. In addition, during academy training, a considerable amount of time is spent on training officers to use lethal force as a means of self-preservation.

The emphasis on self-preservation likely reinforces mortality concerns for officers. These concerns are accompanied with other reminders of the potentially life-threatening nature of the job, including the fact that every day police officers put on Kevlar vests, to protect themselves from shooting, and strap handguns to their body. In addition, they may spend considerable time each year participating in traditional firearms training or using simulators (or other techniques) to create situations where officers must make split

second decisions regarding whether to discharge firearms to ensure their survival.

Consequently, Maskaly and Donner (2015) argue that police are in a state where MS is frequently primed and clear in-group and out-group distinctions exist. Community members may be perceived as worldview threatening others, who both derogate police by making critical accusations against them, or who pose threats to officer safety and survival. The combination of MS and the presence of worldview threating suspects and individuals create a situation where worldview defensive strategies may be employed. However, the approaches of assimilation and accommodation are generally not feasible. Although derogation may occur to some degree, the emphasis of officer training on the use of force makes annihilation a mechanism that officers may be inclined to utilize. In addition, previous research has shown that strong authoritarians (Altemeyer, 1996), a trait traditionally associated with a police personality (Brown & Willis, 1985), are more likely to exhibit hostility and violence (Jost, Glaser, Kruglanski, & Sulloway, 2003; Jost & Hunyady, 2005) and intensified worldview defense following MS (e.g., Greenberg et al., 1990).

Of course, many situations where police officers interact with worldview threating others do not result in the death of unarmed suspects. However, police may become sensitized to either the MS primes they are exposed to on a daily basis or to the impact worldview threating others have on them (e.g., by taking insults and criticism less seriously, or becoming more callous and detached over time). Certain situations may also elicit MS that ultimately leads to extreme worldview defensive reactions, most notably in the form of annihilation (e.g., deadly force). This may occur when an officer is killed in the line of duty. The shooting of an officer is a well-publicized event in a community, potentially enhancing MS in officers, by reinforcing the highly dangerous nature of the job. Maskaly and Donner (2015) provide evidence for this possibility by noting that a number of highly publicized shootings of unarmed suspects, including Tamir Rice in Akron, Ohio (Heisig, 2017), and Amadou Diallo in New York City (New York Daily News, 2015), occurred in close temporal and physical proximity to the shootings of police officers.

Issues related to in-group/out-group categorization and social identity may produce similar trends on the part of community members, who may have MS activated by the death of unarmed suspects. These situations may create a sense of the unpredictability of the world, reinforcing the thought that death is beyond our control, and may occur at any time. These concerns may interact with a general belief that one cannot get fair treatment by police officers or in other aspects of the legal system. Given the aforementioned research indicating that MS increases procedural fairness concerns, it is reasonable to expect that police officers would be viewed as a worldview threat,

either by direct means (capable of depriving an individual of their life or freedom) or as an indirect threat (as a representative of the justice system that is perceived to be biased against an individual based on group identification [e.g., racial]). The power differential between police and the community may make annihilation largely an unrealistic or unwise worldview defense mechanism. In addition, assimilation and accommodation may not be practical either. However, derogation, in the form of highly critical social protest and condemnation of police officers and departments, consistent with the *Black Lives Matter* movement, may be manifested.

CONCLUSIONS

The inherent relationship between morality and legality make TMT particularly useful in understanding a myriad of legal issues. However, as we have discussed in this chapter, the connection between MS and legal issues is complex. Existentially based concerns may lead individuals to engage in a variety of illegal activities in defense of their cultural worldview. These activities may be driven by a need to enhance self-esteem through specific risk-taking or violent domination over others, or through attacks on targets that pose worldview threats, manifested in hate crimes or terrorist attacks. As violent behavior is often morally and legally condemned, offenders are generally viewed in negative terms and individuals are motivated to seek greater punishments for them. But, desire for enhanced punishments may be tempered when the offender has engaged in behaviors that defend legal decision makers' worldviews, or when procedural fairness concerns are activated. In addition, a variety of individual characteristics such as self-esteem, authoritarianism, attachment style, just-world beliefs, and nullification proneness may moderate MS effects. Attorneys may be able to focus on such characteristics during the jury selection process, or increase MS in the courtroom through the use of specific language or exhibits. In some cases, jurors may experience enhanced MS as a function of highly publicized events that occur during or shortly preceding a trial (e.g., highly publicized mass shootings) or from the nature of a trial, especially one involving capital punishment. However, MS effects are most powerful when individuals' thoughts focus on their own mortality rather than the deaths of others. TMT is also useful for understanding other criminal justice issues of national importance, including attitudes and responses to illegal immigrants, and understanding both the motivations for, and responses to, police use of force resulting in the deaths of unarmed civilians.

Ultimately, all of the aforementioned behaviors may be the partial product of cultural worldview engagement and defense. Often, those behaviors can lead to members of a particular group being harmed in some way. However, the actors causing harm may view their actions as justified because

they believe they stand on moral high ground through the defense of their worldviews against threatening and opposing cultures and belief systems (Pyszczynski, Rothschild, & Abdollahi, 2008). At the same time, increased hostility and violence are not inevitable responses to existential concerns. Pyszczynski et al. (2008) argue that responses to worldview threats are contingent upon how one can best protect aspects of one's beliefs at a given time. Through the reinforcement of self-esteem, by exploring avenues that allow shared characteristics between in-group and out-group members to become salient, by promoting fair process concerns, and by exploring situational factors that lead actors away from the most destructive worldview defensive reaction of annihilation, and toward derogation, if necessary, and ideally toward accommodation, it may be possible to reduce destructive behavior caused by MS. In the end, the hope would be that these avenues promote more pro-social responses and lead to greater justice in the legal system.

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Chapter 22

Applying Terror Management Theory to Art, Film, and Media: A Theoretical and Empirical Review

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> *Plot is the emotional expression of inner events, and thus death is the emotional cipher for giving up the role that cannot be won...Death is the most frightening and stirring experience imaginable, and since the basic moral law of art requires that it excite our feelings only when they can provide insight, this means we must be careful with death.*
>
> Rudolf Arnheim (1932/1997, pp. 72–73)

> *Death's an art, flesh and earth never part, a power of the mind. Death shines on the air of silence, a ritual of endless time.*
>
> Kerry King, Araya, and Hanneman (1988, track 8)

Prior to the emergence of terror management theory (TMT) and the experimental existential psychology movement, the topic of death did not occupy a prominent place in academic social psychology. Such was not the case in some earlier 20th century theorizing in psychology, as well as in other disciplines such as the humanities, where the fact of human mortality has always played a central role. In particular, there is a tradition of psychological studies of art and film emphasizing the importance of depictions of death, its fear, and immortality striving. Indeed, the psychoanalytic thinkers who inspired TMT repeatedly turned to contemporary art to derive inspiration and test their theories. Rank (1914) drew on the first independent horror film ever made, *Der Student von Prag* (1913), to develop his interpretation of the "Double" motif as an ambiguous symbol of immortality and mortality. Becker, the direct intellectual predecessor of TMT, dedicated entire chapters

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of his book *Angel in Armor* (1969) to the analysis of works of literature (Kafka's 1912 story *The Judgment*) and film (e.g., Sydney Lumet's *The Pawnbroker*, released 1964). One of the many interdisciplinary contributions of TMT to psychology has been the burgeoning revival of this tradition of utilizing art to understand our psychological relationship with death, and vice versa.

The importance of this endeavor is attested to by the fact that depictions of the human attempt to come to terms with mortality have been endemic to all forms of art, but especially plot-driven forms such as poetry, literature, and film, since their remotest origins and throughout our collective history (Hankiss, 2001; Townsend, 2008). Although virtually countless examples could be called upon, here we will commence with only two, separated by the space of six centuries.

The first, *The Plowman from Bohemia*, is a 15th century work of German literature that imagines a legal debate, before God, between death and a simple farmer attempting to bring him to justice for the cruel, premature death of his wife. The second, Michael Haneke's 2012 film *Amour*, depicts the painful process of dying as a husband cares for his ailing wife through a series of strokes. Radically different cultural perspectives on mortality and art differentiate these works on every level. *The Plowman* is characterized by lengthy philosophical arguments presented against a personified death, and assumes a metaphysical plane of existence that makes possible the redemption of mortal beings. A product of secular (post)modernity, *Amour* eschews dialog that might facilitate the process of making meaning from death, and instead displays the physical process of decay in almost scientific detail. Yet possibly the important lesson to be derived from considering these works in tandem is not their difference but their similarity. In a heartbreaking sequence Georges, *Amour*'s protagonist describes his wife's fading existence to their daughter Eva:

> *We do our speech exercises every day, or we sing together...We change her diaper, I put on cream to avoid bed sores...Sometimes she talks about her childhood, or she calls for help for hours on end...Suddenly, she bursts out laughing, or she weeps...None of all that deserves to be shown...What happens now is what's happened until now. It will go steadily downhill for a while and it will be over.*

Centuries of technological and medical development have not fundamentally altered the human relationship to death, encapsulated long ago in the Plowman's lament:

> *Wretched, lonely and full of sorrow I remain, without amends from you; I could never obtain reparation from you for your grievous crime. How about that, Death, Sir, you wrecker of all marriages? ...You will give nobody satisfaction for your ill-doing, will make no compensation...You are accustomed to being cursed; at all times and places you are pitiless.*
>
> von Saaz, 1966, pp. 41–43.

The ultimate futility of struggle against mortality has always haunted humankind. As TMT research has affirmed, people spend much of their lives in pursuits engineered largely to deny this truth. Art is one domain of human striving where, unexpectedly, the hard truth sometimes draws closer to the surface. When, in *Amour*, Eva—who sees her father distraught with the experience of watching his beloved's life slowly drain—confronts him with the statement, "You can't go on like this," he simply replies, "I can't? What do you suggest?"

There are two clear points of unique impact for TMT when it comes to achieving an interdisciplinary understanding of art and art appreciation as basic human endeavors. First, the framework can contribute to the extant theoretical literatures of film, art, and literary studies. Given that much of the work applying TMT to the theoretical analysis of art has been done with respect to cinema, our first current aim is to situate TMT perspectives on film in relation to the broader humanities literature. This aim first requires an overview of the corpus of writings on death in film studies proper, before considering TMT's own (potential) contribution. Second, as an empirical framework, TMT can enhance our scientific understanding of how and why people respond to and create art. Our second aim is thus to review the already substantive body of empirical studies demonstrating the effects of death consciousness on attitudes toward art and media, as well as the anxiety-buffering role of experiencing art and creativity. This is an exciting moment to take stock of the work that has been done, as both of these areas of research and theorizing have developed largely in the course of the last decade, and show no signs of slowing.

TREATMENTS OF DEATH IN FILM STUDIES SCHOLARSHIP

Speaking in generalizations, works of film analysis from philosophy and the humanities typically belong to one of two categories. One tradition involves creating a dialogic space between films and a particular theoretical perspective on human concerns (Rodowick, 2014). Works in this tradition sometimes employ films to illustrate the cogency of an analysis of psycho-social universals; but they also often situate films in light of the collective psychology of a given historical period. Death has been directly taken up as a theme in some insightful works in this plot-and-theory canon. Noted film scholar Mulvey (2006) resurrected filmmaker Peter Brooks' insight that the Freudian *death drive* is a vital key to discerning the psychological significance of plot in mainstream films. Using different approaches, Russell (1995) and Hagin (2010) both build on this insight by cataloguing the various uses of death as one of the "two grand conventions of narrative closure, devices that allow the drive of a story to return to stasis" (Mulvey, 2006, p. 71; the other convention is marriage). Russell (1995) highlights the important distinction between films that use a main character's death to provide this kind of

narrative closure (e.g., famously, *Citizen Kane*, 1941) and those where death fails to offer any clear sense of closure or redemption (e.g., the "too early" death of Marion Crane in *Psycho*, 1960; see Williams, 1991). Focusing on classic Hollywood narratives that tend to offer portrayals of death as meaningful, Hagin (2010) offers the following typology:

> *There are three roles that death can have within a linear causal storyline. It can be an* initial death, *which begins a storyline and is a cause of subsequent events; an* intermediary death, *which is both an effect and a cause within a storyline; and a* story-terminating *death, which ends a storyline and is an effect of previous events. There are three aspects in which death can be meaningful within such a cause-and-effect chain of events: story-terminating and intermediary deaths can be meaningful* in relation to the past, *by being results of previous events. Initial and intermediary deaths can be meaningful* in relation to the future, *by being causes of subsequent events. Death can also remain part of an ongoing event with no end in sight, which might be thought of as a type of intermediary death that is* meaningful in relation to the present *(pp. 4–5).*

Of course, deaths depicted at these various linear moments do not exhaust the narrative use of mortality in film. It is clear enough that throughout the history of art—and perhaps especially in film—the threat of death has served as a means to heighten the significance of the narrative and reinforce conventional ideologies of heroism. The hero's capacity to evade imminent death—and to take the life of the enemy—dramatically affirms the righteousness of the worldview which the hero represents (Becker, 1975; Gibson, 2001). At the same time, stories depicting the everyman's confrontation with mortality—such as *Amour* and *Death and the Plowman*—are believed to have the potential to heighten the viewer's own self-awareness and ethical sensibilities (Niemiec & Schulenberg, 2011; Sobchack, 1984). Hence Aristotle's (1987) *Poetics*, the earliest known work of literary theory, insists that, to serve an edifying purpose, tragedy should include "deaths in full view" (p. 15).

The second broad strand of film scholarship revolves around the attempt to understand the *form*, rather than (or in addition to) the content, of film from the perspective of aesthetics, psychology, and philosophy of history. Analyses of the concepts of mortality and immortality in relation to film's aesthetic form have proliferated in the past two decades. These can again be subdivided into two general types. One set of writings grapples primarily with the paradoxical notion of *showing* death in a (fiction) film. Clearly, films depict death at an alarmingly high rate—1 death per every 8 min in the standard U.S. popular film (Schultz & Huet, 2000). But how exactly does the viewer—who, by definition, has not experienced death—process these depictions? One scholar, Asbjørn Grønstad, has suggested that death in film often operates according to one of two logics: (1) an *a-mimetic* logic,

meaning we process cinematic deaths not in relation to personal experiences but rather to a schematic catalog of other artistic portrayals (Grønstad, 2008); and (2) a logic of *anticipation*, which approximates the viewer's personal experience of death by prompting identification with a character who is witnessing the death of another (typically a loved one as in *Amour*; Grønstad, 2016).

Other writings probe the influence of mortality awareness on viewers' relations to the "triptych" of modes for recording reality—the photograph, celluloid film, and the new digital media (Mulvey, 2006). Influentially, Barthes (1980) proposed that photography permits new ways of understanding death outside of the trauma of personal experience and the filter of cultural ideology, "a kind of abrupt dive into literal Death" (p. 92). Stewart (1999) discusses the significance of the fact that death is often depicted in film using the freeze frame, conjuring photography's paradoxical ability to preserve life even while stripping it of vitality. A wave of scholarship was inspired by the centenary of public cinema in 1995, which happened to coincide with the release of Pixar's *Toy Story*, the first fully computer-animated commercial feature. In that moment "computer-generated imagery (CGI) broke the special relationship that existed between photography and the world...the history of motion pictures was now, in effect, the history of animation" (Hoberman, 2012, pp. 4–5). Here, form interacts with content in the study of film's rapprochement with death: if the invention of celluloid film gave humanity the potential to partially master mortality through the recording and sculpting of events and people as they existed in particular spaces and times (Tarkovsky, 1986), what were the implications for the cinema–mortality relation of the return to secondary illustrations of reality?

Importantly, in the last 15 years, both types of film scholarship—that which focused on plot and theory, and that which focused on cinematic form—have converged around the historical significance of September 11, 2001. In attempting to process the ramifications of this event for global history—as have scholars in psychology and other disciplines—film theorists have become increasingly sensitive to the significant connections between death, art, and cinema. Scholars (Kellner, 2010; Prince, 2009) have argued that Hollywood images—particularly those of the classic action film—must now be understood against the background of 9/11 and its fallout, even if mainstream cinema increasingly turns to escapist forms (such as fantasy and superhero films) to avoid potentially traumatic direct confrontation of these issues. At the same time, others (Hoberman, 2012; Mulvey, 2006) have noted the significant historical convergence of 9/11—an event which was mediated for most people through television, blurring the lines between real and fictitious recordings of apocalyptic terror—and the rise of digital cinema, ushering in a potentially new era of understanding the links between art, visual perception, and death awareness.

TMT AT THE INTERSECTION OF PSYCHOLOGY AND FILM/MEDIA STUDIES

Within psychology, TMT research and theory has been at the forefront of the attempt to understand how universal death awareness and historically contextualized mortality reminders such as 9/11 influence consciousness and social behavior. The basic tenets of and empirical foundation for TMT make a clear potential contribution to studies of death, art, and film, which is beginning to be drawn out in a series of recent interdisciplinary works.

As a theory of how humans are motivated by death awareness, TMT (Greenberg, Pyszczynski, & Solomon, 1986) provides a broad, empirically supported framework for understanding the role of death anxiety in everyday human behavior. Beginning with the proposition that humans are biologically motivated to preserve their own lives, but endowed with a symbolic self-awareness that offers evidence of the ultimate futility of this pursuit, TMT contends that people manage the potential for death anxiety by investing in personal quests for *self-esteem* within the social dynamics of validating and regulating *cultural worldviews*. Hundreds of studies (for review, Pyszczynski, Solomon, & Greenberg, 2015) have shown that experimental reminders of mortality (compared to other aversive topics) subsequently motivate individuals to show greater investment in and defense of the particular domains of self-esteem striving (e.g., academic performance; physical appearance) and cultural belief (e.g., religion; political identity) that they consider personally significant. Importantly, these effects occur without any conscious awareness on participants' part of the link between death awareness and cultural strivings, and extend to active derogation and aggression against others who represent alternate ideologies, as well as to behavior that it is literally mortality-enhancing (e.g., a smoker who derives self-worth from their *avant-garde* image will want to smoke more, not less, after being reminded of death). To summarize the theory's central argument, it is the existential premise that humans—cursed with the knowledge of their finite animality—prefer to believe they exist on a symbolic, super-animalistic plane of culturally mediated *immortality*, whether that be vouchsafed through the literal conquest of death promised by religion, or the indirect transcendence offered by human relationships and immersion in a collective.

Because the theory is not necessarily focused on how people understand death *per se*, nor on people for whom death is a chronically salient cognition (e.g., the elderly and infirm), TMT stands to fill an interesting gap in studies at the intersection of narrative film and mortality concerns. In particular, it can be leveraged to analyze how death awareness and the compensatory striving for immortality motivate characters in films and scenes that do not explicitly focus on death. In other words, TMT facilitates comprehension of the significant role of death in human life, and its artistic portrayal, exactly under those circumstances "when death *does not appear under its own name*;

in areas and times which are not explicitly dedicated to it; precisely where we manage to live *as if* death was not or did not matter, when we do not remember about mortality" (Bauman, 1992, p. 7).

This potential was first illustrated in Sullivan, Greenberg, and Landau's (2009) analysis of the Hollywood New Wave films *Rosemary's Baby* (1969) and *Straw Dogs* (1971). This article suggested that, although both of these films very explicitly evoke the specter and, in the case of *Straw Dogs*, the spectacle of mortality, they are arguably more deeply understood through an analysis that stresses how conflictual strivings for *immortality* drive the action and horror of their plots. The neurotic, patriarchal terror of *Rosemary's Baby* stems from the fact that Rosemary's (Mia Farrow) immortality project—of having offspring under the traditional shelter of the Catholic worldview—is co-opted and perverted to fulfill the immortality quests of her husband (an aspiring film star played by John Cassavetes) and the coven of witches seeking eternal life through Satan. *Straw Dogs* depicts the violent cataclysm that results when an urbanized couple (David and Amy; Dustin Hoffman and Susan George) return to live in the rural English village where Amy was raised. Cultural conflicts stem from the fact that David copes with mortality through complete intellectual repression of his animal nature, while the villagers embrace a Darwinian and patriarchal worldview of esteem through brutality, and Amy is (almost literally) torn between these worlds. The clash of these competing cultural modes for coming to terms with human animality results in Amy's traumatic rape and David's terrible reawakening as a creature of beastly violence. Thus, as has happened so often in history and as TMT illuminates, people's systems for denying their finitude motivate them to enact violence and death in attempts at compensatory domination. In the case of the narrative of *Straw Dogs*, this violence irrevocably shatters David's and Amy's sense of their own identities, leaving them physical survivors but psychological victims of the awareness of human animality.

This initial analysis demonstrated how, in the comparative analysis of film narratives, character motivations and conflicts may be recast in light of the TMT framework as the interlocking of various modes of repression and immortality striving. The insights of TMT for artistic narratives and themes were further utilized in a subsequent series of articles. Entering the world of literary analysis, Sullivan and Greenberg (2011) deconstructed the symbol of evil children in literature broadly and in Doris Lessing's (1988) *The Fifth Child* in particular, comparing the perspective of TMT and Otto Rank to other psychoanalytic interpretations. This approach demonstrated the importance of historically contextualizing narratives of immortality striving in light of major cultural forces. From this vantage, 20th century depictions of evil children can be understood as repressively symbolizing the mortality of parents who defy a modernist mode of immortality through work and cultural production by investing in biological reproduction (*Rosemary's Baby* can be

understood in similar terms). Employing a less historical and more existentially centered analysis, rooted in the theorizing of Paul Tillich (1952), Sullivan (2012) demonstrated how death anxiety can play a key role even in films that eschew conventional narrative structure. Specifically, the "stream-of-consciousness" film *Mirror* (1974) by Russian auteur Andrei Tarkovsky—one of the classics of world cinema—can be understood as a poetic meditation on how all human anxieties are ultimately framed by the psychological context of our recognized finitude, and how we can marshal the "courage to be" not only in spite of but *through* this very death awareness. A subsequent philosophical anthology on themes in the work of Tim Burton showed the usefulness of TMT for engaging with directors who repeatedly depict mortality. Rank's ideas concerning evil children as "Doubles" standing in for death, and his analysis of the dialectic between living and creating in the pursuit of immortality, again unearthed the affective logic of films like *Vincent* (1982) and *Beetlejuice* (1988; Sullivan, 2014). Alternatively, McMahon (2014) considered how Burton's experiments with genre blending have facilitated the conscious contemplation of death by mainstream audiences, possibly circumventing the defensive distal responses observed in TMT research and allowing more authentic coping to emerge.

These initial efforts at applying TMT to film and literary analysis resulted in the first interdisciplinary anthology dedicated to scholarly consideration of depictions of death in film—*Death in Classic and Contemporary Film: Fade to Black*, edited by Sullivan and Greenberg (2013a). With contributions from psychologists working in the TMT tradition as well as film scholars and critics, philosophers, and literary theorists, the volume approached its subject from a variety of perspectives and opened a dialog between TMT analysis and more established frameworks in film studies. In addition, the volume connected the work of TMT scholars with that of others who had independently utilized Ernest Becker's ideas, prior to widespread interdisciplinary awareness of TMT, to theorize trends and motifs in film and literature. For instance, existential psychologist Schneider (1993) had previously incorporated existential perspectives on posttraumatic growth into his work on the horror genre, while Farrell (1998) examined similar themes of death anxiety and trauma in *fin-de-siècle* literature; both authors contributed new essays to *Fade to Black*. Where the specific application of TMT to film is concerned, some advances included the first use of the constructs of death denial and immortality striving to analyze entire film genres, such as the apocalyptic film (Lieberman & Fergus, 2013) and the superhero film (Koole, Fockenburg, Tops, & Schneider, 2013). Another essay problematized the TMT perspective by considering films from Native American directors which seem to advocate a more direct and less defensive psychological engagement with death as a part of life (McMahon, 2013).

Although the great bulk of the work introducing TMT to film and media studies has been more of the plot-and-theory canon—leveraging TMT and

related perspectives to illuminate aspects of film narratives that might otherwise remain obscure—there is also considerable potential for TMT to contribute to analyses of film form and technique, as well as the psychology of its reception.

In particular, TMT stands to make a unique impact on the interdisciplinary literature regarding the effects of exposure to violent death imagery on social psychological processes. As is well known, there is a large and still controversial literature regarding the extent to which violent media promotes aggressive behavior, scattered across social psychology (Anderson, Bushman, Donnerstein, Hummer, & Warburton, 2015), film studies (Barker & Petley, 2001; Prince, 2000), and communications research (Potter, 1999). Most of this literature—regardless of methodological and normative variation—focuses on the effects of *specifically violent* content in media. To offer two prominent examples: Innovative filmmaker Eisenstein (1947) put to work his concept that depicted violence arouses intense emotion and, when combined in a montage with certain ideological symbols, can thereby increase viewer identification with a given ideology. Psychologist Zillmann (1998) has carried out a program of research supporting the notion that viewers respond particularly positively to violent content that reaffirms belief in a just world, i.e., a sanctioned hero restoring justice by violently punishing a villain.

While both these arguments have clear merit, TMT adds nuance to the overall picture of how on-screen violence interacts with psychological investment in normative worldviews and meaning systems. This nuance stems from the theory's distinction between proximal and distal defensive processes, reviewed elsewhere in this handbook (Chapter 2, this volume). The core of the idea is that when individuals are confronted with vivid reminders of mortality, they initially engage in superficial defenses to directly defuse the fear of death. In the case of a viewer of film violence, it is clear that there are a range of ready-to-hand proximal defenses connected to the "a-mimetic" (Grønstad, 2008) nature of screened deaths: this is not real, I can close my eyes, this looks so fake, etc. (Hill, 1997). From a TMT perspective, however, what is interesting is what occurs psychologically in the *time after* the initial presentation of death-related content. Studies have amply demonstrated that distal symbolic defenses—such as investing in one's cherished cultural beliefs—occur after exposure to mortality thoughts and only once those thoughts have receded from focal, conscious awareness. This thesis offers an interesting vantage from which to understand the cinematic effect of violent death. It suggests that violence in film may be more likely to reinforce adherence to cultural worldviews when the violent content is shown *before* and *apart from* the primary ideological content (almost directly contradicting Eisenstein's montage theory; Sullivan & Greenberg, 2013b). Although this hypothesis has yet to be thoroughly tested, we review some relevant empirical studies in the media and communications literature

below. This and other ideas concerning the relationship between mortality salience and cinematic technique are promising directions for future scholarship on TMT and film.

Having overviewed the ways in which TMT has contributed to, and has potential to further advance, the interdisciplinary project of film and literary analysis, we now consider empirical data in the large TMT literature that have relevance for the psychology of art production and reception. These topics have been, for more than a decade, among the vanguard of themes with applied significance examined through the framework and methodology of TMT. Much of this work was systematically reviewed in Landau, Sullivan, and Solomon (2010), but a variety of further relevant studies have been published in the interim. We organize this comprehensive review of the findings on death awareness and artistic creation and consumption according to three topics that have received the bulk of research attention: (1) effects of mortality salience on aesthetic preferences; (2) effects of mortality salience on responses to commercial media; and (3) the role of artistic activity and experience in buffering death anxiety.

STUDIES DEMONSTRATING EFFECTS OF MORTALITY SALIENCE ON AESTHETIC PREFERENCES

Goldenberg, Pyszczynski, Johnson, Greenberg, and Solomon (1999) were among the first to empirically investigate the links between art, culture, and individuals' defenses against death anxiety. Specifically, they asked the question: If managing death anxiety is a fundamental human motivation, why are suffering and death such central themes of artistic expression? Artworks involving tragic elements constitute a significant portion of human aesthetic creation; humans seem preoccupied with stories of unjust suffering and hardship. From a TMT perspective, tragedy could serve a psychological function for individuals by providing them a safe environment in which to symbolically explore their own mortality.

To examine this possibility, Goldenberg et al. (1999) observed individuals' emotional response to and enjoyment of tragic versus neutral literary passages. They predicted that participants would enjoy and be more touched by tragic passages after being exposed to mortality salience (MS). After manipulating MS by randomly assigning half the participants to write short responses to prompts about the fact of their eventual death, Goldenberg et al. presented tragic and nontragic passages from Hemingway novels to their participants. Importantly, the tragic passage explicitly touched on themes of bereavement and death. While participants tended to enjoy the tragic passage more regardless of condition, there was also an interaction between MS and passage type for rated enjoyment and emotional response. For the tragic story, participants reported stronger emotional responses when they had previously been exposed to the MS prime, but there was no such effect for the

nontragic passage. Additionally, the MS prime led to less enjoyment of the nontragic passage relative to the control prime. These results indicate that individuals are increasingly moved by tragic literature after MS, and suggest that affective experience could play a role in drawing individuals toward tragic stories and away from nontragic content.

Mortality Salience and Meaning in Art

Since Goldenberg et al. (1999)'s research, a number of publications have expanded our understanding of the effects of MS on aesthetic preferences. Landau, Greenberg, Solomon, Pyszczynski, and Martens (2006) were among those who made an important advance in this domain. Building on previous research suggesting that MS leads people to prefer simple and consistent cognitions (Landau et al., 2004), Landau et al. (2006) explored relative preferences for abstract, unconventional modern art as a function of MS. Because MS typically induces a preference for easily interpretable information, one would expect that abstract modern art would be aversive to those who are engaging in distal mortality defense. Supporting this prediction, Landau et al. (2006) found that an MS induction leads people to find abstract art less attractive (Study 1), that individual differences in personal need for structure (PNS) moderate this effect (Study 2), and that people's dislike for abstract modern art is diminished when a meaning-providing title is included along with the artwork (Study 3).

More recently, research has investigated the relative impact of fear of nonbeing and death-related uncertainty on liking of meaning-threatening photographs (Rubin, 2017). This research showed that people who are dispositionally high in fear of self-annihilation and PNS were the most likely to dislike a meaning-threatening image (a picture of a fisherman with a horse's head holding a cat) relative to a control image. No such effect emerged based on dispositional levels of death-related uncertainty, suggesting that fear of death influences perceptions of meaning-threatening art, independent of uncertainty. Together, these works show how fear of death (both manipulated and measured) and high PNS interact to influence people's preferences for meaning threatening visual stimuli, and indicate that such artwork may pose a threat to people's meaning-laden worldviews.

This work, however, raises questions regarding the artistic preferences of individuals who are low in PNS. Some research has addressed this gap by examining individuals' tendency to search for novel meaning in art and other domains (Vess, Routledge, Landau, & Amdt, 2009). While individuals who are high in PNS prefer artwork with clear structure and form, those who are low in PNS appear to be more open to exploring alternative worldviews after exposure to an MS prime. Specifically, Study 2 of Vess et al. (2009) showed that, after exposure to an MS prime, participants lower in PNS expressed more interest in documentaries about unfamiliar themes (e.g., a documentary

about the experiences of Chinese immigrants to America). These authors argue that individuals low in PNS, in contrast to their high-PNS peers, may actually experience a greater sense of meaning in life from exploring novel perspectives and ideas. While this thesis deserves further examination in the domain of aesthetic preferences, these findings affirm the general insight from TMT that variation in personality partly captures differences in how people cope with mortality awareness, which includes preferences for art and media.

TMT research has also examined the distinction between *enjoyment* and *appreciation* of artistic creations. While several of the studies reviewed in this section do not independently measure enjoyment and appreciation of art, it is likely that these are distinct constructs. Indeed, some literature has begun to differentiate between hedonistic and eudaimonic motives, with the latter being characterized as positive feelings resulting from "expressiveness and self-fulfillment" (Perloff, 2016, p. 53). Many consumers can appreciate (i.e., think highly of or value) a work of art without enjoying it. In fact, art that is hardly enjoyable at all can impart a sense of meaning by conveying values or beliefs that the perceiver holds in high regard, an offering that is particularly valuable when staving off death anxiety. A prototypical example of an artwork that presents an ostensibly unpleasant viewing experience, but which achieved widespread acclaim due to its ideological content, is Gibson's *The Passion of the Christ* (2004), grossing over $600 million despite being a subtitled film featuring graphic violence.

Some research (Hofer, 2013) has shown that, following an MS prime, individuals who are dispositionally high in the search for meaning actually appreciate a sad but meaningful film more, while simultaneously enjoying it less, than individuals low in search for meaning. In the case of this particular study, the film clip depicted a woman coping with her own inevitable death. One would expect that such a narrative, focusing on themes of death, would be aversive to those who have recently been threatened with thoughts of their own mortality. However, art that affirms values held by the participants and depicts another person coping with self-annihilation in an admirable way (e.g., with grace) may actually provide a way of constructing meaning out of tragedy. Due to this juxtaposition of suffering and grace, observers are able to appreciate the acts and values presented in the film despite (or perhaps because of) its distasteful content, particularly when they are existentially motivated.

One of the frontiers for this area of research is investigation of the neural correlates of art consumption under MS. Because TMT proposes that self-esteem constitutes one resource on which people rely to ward off death anxiety, it is possible that the degree to which a piece of art is interpreted self-referentially could relate to whether that art provides assurance against death anxiety. Thus, under MS, artwork that has no clear meaning may be interpreted more self-referentially in order to derive meaning from its

content. For example, people may be motivated to interpret works lacking clear, concrete meaning (e.g., surreal art) in self-referential ways in order to obtain a sense of personal meaning and structure. Supporting these ideas, Silveira et al. (2015) showed that, under control priming conditions, brain regions associated with processing self-relevant stimuli displayed more activation in response to naturalistic as opposed to surrealistic paintings. However, under MS, the same degree of activation of self-relevant regions was observed regardless of whether the paintings were naturalist or surreal. This pattern fits the prediction that MS would lead individuals to search for self-relevant meaning in surreal art.

Art and Artists Symbolizing Worldview Strength

As described by TMT, a prominent way in which people defend against MS is to immerse themselves in symbols and practices associated with their cultural worldview. Rank (1932/1989) was an early analyst of the ways in which artworks across history and medium have served the function of *concretizing* abstract cultural beliefs, and hence greatly facilitated culture's role in quelling mortality concerns. Selimbegović, Friedman, and Chatard (2013) have provided evidence that responses to music, which can symbolically represent and convey cultural values, often reflect individuals' existential need to bolster their cultural worldview. Specifically, these authors investigated, in a French sample, the interactive effect of MS and right-wing authoritarianism (RWA; Altmeyer, 1998) on evaluations of national (i.e., French) and foreign (i.e., American) music. These authors predicted that MS would increase participants' desire to bolster their cultural worldview, and therefore be related with more positive evaluations of music representing one's own culture. Additionally, RWA, like other rigid psychological styles, has been shown to increase people's reactivity to threats such as MS. While French participants preferred and felt more positive emotions in response to American music as a whole, this difference was less pronounced among high-RWA participants who had been primed with thoughts of mortality. While not conclusive, these findings suggest that MS may prompt some individuals to identify with nationalistic art, even if that art is typically less preferred.

In an investigation of another form of culture-symbolic art, Beck, McGregor, Woodrow, Haugen, and Killion (2010) researched preferences for Christian art among Christians. In an effort to understand what some believe to be a decline in the artistic quality of popular Christian art, these researchers used TMT to explain preference for faith affirming art that is of lesser overall quality. Working with a Christian sample, Beck et al. directly compared preferences for mass-commercial Christian art relative to non-Christian art taken from major galleries. Participants primed with MS (vs. dental pain) found a Christian work of art to be more likeable than a

non-Christian work of art. This effect was observed even though the non-Christian piece of art would be attributed greater value by the artistic community. Taken together with the work of Selimbegović et al. (2013), these findings affirm that worldview-consistent art that might otherwise be less preferable may be suddenly more preferred under conditions of existential threat. This conclusion is further supported by correlational research suggesting that dispositional fear of death is associated with a stronger preference for nostalgic consumer products—objects that elicit positive feelings that "were more common in their earlier days" (Zhou, Wang, Zhang, & Mou, 2013, pp. 2406–2407). It is likely that MS would increase preferences for nostalgic, cultural-worldview affirming themes in art and even art from prior eras, even if that art would normally be deemed inferior to other, contemporary forms.

Interesting research has extended the TMT perspective beyond examinations of preferences for worldview-affirming art to those for immortality-affirming *artists*. In this connection, culture's "fame industry" might be fueled not only by the immortality-striving of inner-circle artists and celebrities, but also the thirst for vicarious immortality among their millions of fans. The phenomenon of "celebrity worship" might have more psychological significance than is clear at first. Celebrities are accorded a high degree of cultural significance for their works, and serve as exemplars of those who have achieved symbolic immortality. One might therefore expect that, after mortality is made salient, artistic works produced by celebrities would receive preferential evaluations. Indeed, research shows that, following an MS prime, art that is attributed to a celebrity is more positively evaluated than the same artwork attributed to an obscure artist (Greenberg, Kosloff, Solomon, Cohen, & Landau, 2010). This phenomenon, at its core, is a prime example of worldview adherence under MS.

STUDIES DEMONSTRATING EFFECTS OF MORTALITY SALIENCE ON PREFERENCES FOR COMMERCIAL MEDIA

Given that many people in today's globalized society devote much of their leisure time to the consumption (or passive reception) not of "art" or film, but rather commercial media, it is critical to understand how existential threat impacts engagement with these distinct cultural products. The growing research literature in this area suggests that many of the same effects of MS on reactions to visual art and film can be observed in reactions to commercials, television, and other media.

For example, Taylor (2012, 2013) investigated the role of terror management processes in television programming preferences. Building on the idea that one's worldview must depict a world that is fair and just in order to serve a death anxiety-buffering function (Pyszczynski, Solomon, & Greenberg, 2015), Taylor (2012) investigated whether MS would increase

interest in programming related to law and order. Taylor predicted that people should prefer justice-focused television shows (e.g., crime and courtroom dramas) after MS because such programming should enhance the belief that the world is fair and predictable. Two studies showed that MS primes, relative to controls, led participants to report greater interest in programming with the theme of justice. Additionally, this effect appeared to be independent of one's own trust in law enforcement (Study 2).

In a methodologically similar analysis, Taylor (2013) investigated whether MS might also be associated with greater interest in highly sexual media. Because MS had been shown to be associated with willingness to engage in risky sexual behavior (Taubman-Ben-Ari, 2004), interest in promiscuity (Lam, Morrison, & Smeesters, 2009), and interest in sex (Goldenberg, McCoy, Pyszczynski, Greenberg, & Solomon, 2000), Taylor predicted that MS would be associated with increased interest in television containing sexual content. While previous research has shown that people tend to reject the corporeal, animalistic aspects of their existence when defending against MS (e.g., Goldenberg et al., 2001), sex can also serve an important existential function by (1) symbolizing one's intimate connection with another person or (2) the potential for procreation and passing one's genes on to another generation, (3) providing an outlet for hedonic escapism, and (4) allowing for identification with culturally validated standards of beauty and desirability. Thus, various forms of eroticization or objectification of sexuality may offer routes toward transcendence of animality. In line with this analysis, results across two studies showed that individuals who were primed with MS expressed more interest in sexual programming compared to those in control conditions. Additionally, as with the effect of MS on justice-focused programming (Taylor, 2012), this research suggested that neither measures of sexual experience nor sexual values moderated the effects of MS. Importantly, however, more realistic, less eroticized and objectified depictions of female sexuality or physicality are not necessarily preferred under MS (see Goldenberg, Goplen, Cox, & Arndt, 2007).

Beyond preferences for specific entertainment programming, research on the impact of terror management processes on reactions to advertisements has expanded in the last decade. In one of the first investigations of MS effects on perceptions of advertisement media, Dar-Nimrod (2012) showed that participants expressed more interest in commercials that followed clips of death-related programming compared to similar but non-death-related clips. Additionally, in the former case, the pattern of interest in advertisements was more strongly associated with death-thought accessibility than either positive or negative affect. These results are in line with prior research suggesting that the activation of death thoughts often fosters materialistic motivations and intentions (Arndt, Solomon, Kasser, & Sheldon, 2004). This process has been further documented in research showing that MS leads to higher purchase intentions in response to advertisements, and that this

relationship is mediated by changes in death-thought accessibility and not positive or negative affect (Das, Duiven, Arendsen, & Vermeulen, 2014).

In perhaps the most sophisticated examination of MS effects on advertisement reactions to date, Rangan, Singh, Landau, and Choi (2015) examined the impact of mortality content in TV programming on death-thought accessibility over the course of advertisements "pods" (common units for approximately four-minute "commercial breaks"). Across several studies, Rangan et al. found a consistent relationship between the amount of time (or number of advertisements) which passed after death-related programming and death-thought accessibility. Death-thought accessibility is strongest immediately after death-related programming, but tends to fade over the course of the pod. Rangan et al. also provide evidence that, as death-thought accessibility fades, approximately two-and-a-half minutes after the MS stimuli, participants begin to exhibit signs of worldview defense (i.e., distal defense). At the point where MS begins to fade into nonconsciousness, participants begin to react more negatively to advertisements perceived as foreign.

In addition to their timing and placement, the content of advertisements in relation to MS content plays a key role in viewer reactions. Building on evidence that close relationships can ward off death anxiety (see Chapter 10, this volume), Kneer, Hemme, and Bente (2011) investigated whether highly socioemotional (i.e., containing affective and relational content) advertisements would be more effective on individuals primed with MS. Kneer et al. manipulated MS and subjected participants to sets of advertisements that were either highly socioemotional or strictly informational. They found that, among those in the MS condition, more positive commercial and product evaluations and stronger buying intentions emerged in response to the socioemotional ads, a preference that did not emerge in the absence of MS.

In summary, a growing corpus of research complements the work on MS and reactions to art and film by demonstrating that people's responses to diverse media, including television and advertisements, are similarly influenced by death anxiety. Of course, this research has some disturbing implications. While humans have for centuries created art partly to come to terms with their mortality, in the modern era of advertisement-laden entertainment, the very depiction of mortality in a TV program may increase people's consumerist susceptibility to certain forms of advertising.

There is, however, another body of empirical literature on the relevance of death anxiety to art that provides a more optimistic message. While temporarily elevated MS may guide aesthetic preferences, drawing at least some individuals toward worldview-reifying content and increasing materialism, a TMT account also assumes that artistic creation and experience may play an emancipating role in buffering individuals from anxiety. Since art and media often symbolize important values and beliefs for their consumers, it is possible that engaging with such media could be personally affirming and even reduce the need for defensiveness in the face of death awareness. Research

supporting this thesis draws on a long theoretical tradition positing that the purpose of art is to create a "more perfect" world, a world outside of the trials and fears of daily passing time into which the viewer may momentarily escape (Fallico, 1962; Münsterberg, 1916; Tarkovsky, 1986). In Rank's (1932/1989) language:

> *The will-to-form of the artist gives objective expression, in his work, to the soul's tendency to self-eternalization, while the aesthetic pleasure of the enjoyer is enabled, by his oneness with it, to participate in this objectification of immortality...Both of them, in the simultaneous dissolution of their individuality in the greater whole, enjoy, as high pleasure, the personal enrichment of that individuality through this feeling of oneness. They have yielded up their mortal ego for a moment, fearlessly and joyfully, to receive it back in the next, the richer for this universal feeling (p. 110).*

In other words, art allows for the artist and the audience to become allied in an immortality project that connects, rather than alienates, them in their desires.

STUDIES DEMONSTRATING THE BUFFERING EFFECTS OF AESTHETIC RECEPTION AND PRODUCTION

Several studies have examined the potential for engagement with art and media to buffer individuals against death anxiety. One such study comes from the previously described research on preferences for justice-focused television (Taylor, 2013). Taylor predicted that watching justice-focused media (i.e., bolstering the cultural worldview) should alleviate participants' need to rely on other distal defensive strategies (e.g., self-esteem striving). To test this, Taylor examined whether MS (compared to control) and watching a justice-focused film clip (compared to no clip or a clip with nonjustice-related content) impacted a subsequent self-enhancement assessment. In support of the buffering hypothesis, participants who experienced the MS prime and watched the justice-focused clip scored lower on the indicator of self-enhancement than those who did not watch the justice-focused clip or did not receive the MS prime.

Extending such findings, Rieger et al. (2015) explored how watching a meaningful (compared to a pleasurable or informative) movie after an MS prime would impact subsequent distal defense system activation. Based on the patterns observed by Taylor (2013) and the analysis of meaningful films by Hofer (2013), Rieger et al. predicted that watching a meaningful film after being exposed to an MS prime should alleviate participants' need to engage in further defensive processes. Following an MS prime, those who watched a scene from a meaningful film with complex emotional content (Jeunet's *Amélie*, 2001) appreciated and enjoyed it more than those who watched scenes from a Hollywood comedy or a documentary. Furthermore,

participants in the meaningful film condition displayed no difference on a pre- and post-MS measure of the accessibility of self-enhancing constructs. This was in contrast to participants in both the pleasurable and informative film conditions, who responded faster to an implicit measure of self-esteem accessibility post-MS.

Taking the study of art's anxiety-buffering function beyond visual media, Kneer and Rieger (2016) investigated this process within a particular subculture: metalheads (i.e., fans of heavy metal music). In addition to serving as an examination of the psychological importance of artistic subcultures, this analysis provided a unique opportunity to examine the counterintuitive prediction that engaging with metal music, which often contains death-related themes (as exemplified by the quote from the band *Slayer* at the beginning of this chapter), might actually reduce defensiveness among metal fans. Prior to an MS induction, Kneer and Rieger randomly assigned fans and nonfans of metal music to listen to either metal music or an audiobook excerpt. They found that metal fans who listened to metal did not display increased activation of self-esteem (a defensive response) after the MS prime, whereas nonmetal fans who listened to metal and metal fans who listened to an audiobook displayed heightened self-esteem accessibility. Thus, some individuals may actually become less rather than more defensive after engaging with music with death-related content.

In a review of music's relation to TMT processes, Cardany (2017) analyzes how various forms of death-focused music (e.g., metal and Israeli memorial songs) may reduce defensiveness. There are at least two relevant explanations for this phenomenon: listening to death-focused music (1) serves as a cultural prime, thus promoting feelings of affiliation and personal expression or (2) "it may provide an emotionally healthy way to explore existential fears" (Cardany, 2017, p. 12). The fact that the nonmetal fans in Kneer and Rieger's research did not reveal the same death defensiveness-buffering pattern displayed by the metal fans suggests the former process. However, the counterintuitive protective function of music, or art more generally, containing death themes is a fruitful domain for future investigation.

According to Rank, it is not only the act of experiencing art that provides individuals with a reassuring sense of immortality, but the act of creating it as well. Building on these ideas, Arndt, Routledge, Greenberg, and Sheldon (2005) explored the influence of individuation and assimilation goals in the potential for creative activity to counteract thoughts of death. Arndt and colleagues provided evidence that creative expression (a means of obtaining individual immortality) can improve psychological well-being, but only when individuals also feel connected to others around them. For instance, writing a creative story enhanced positive engagement (a composite indicator "reflecting a cognitive and affective expansive orientation," p. 1335) after MS, but only among participants who contemplated how their personal goals benefit others. While the average individual may only derive psychological

benefits from creativity after MS if they are secure in their social connections, other individuals who are low in psychological rigidity or embrace creativity as value may benefit from creative individuation alone. Routledge and Juhl (2012) showed that MS leads participants who are low in PNS to display more creativity in an artistic task relative to a control condition and those who were high in PNS, thus indicating that people who are more open to uncertainty and ambiguity may explore avenues of personal expression after MS. However, this research gives no indication of whether engaging in creativity is an *effective* route for warding off death anxiety. Perach and Wisman (2016) expanded on this finding to explore the impact of creative expression on death-thought accessibility. They observed that a combination of creative goals and creative achievement was associated with lower death-thought accessibility relative to similarly artistically driven, but less accomplished, individuals. Overall, this body of literature suggests that engaging in creative endeavors can have variable appeal and consequence based on the values and psychological characteristics of individuals (for review see Perach and Wisman, 2016).

CONCLUSION: THE FUTURE OF IMMORTALITY IN ART AND MEDIA?

As we wrote this chapter, the creators of the *Star Wars* saga film *Rogue One* (2016) were breaking new ground by presenting audiences with a reanimated dead actor. Peter Cushing, who starred in the first *Star Wars* film and had been deceased for more than two decades when *Rogue One* premiered, was uncannily reincarnated through the use of extensive digital reconstruction of extant footage and a talented impersonating actor. Humans have perennially turned to art as a means for seeking transcendence, however fleeting, of their mortal existence. TMT has made, and stands to continue to make, an important contribution to extant interdisciplinary scholarship on death, art, and media by highlighting and empirically documenting the significance of this psychological imperative. Now that our species has entered a world in which digital technology brings artists closer than ever before to the power of resurrection (at least of a person's likeness), scholars working both with and without the TMT framework should pause to reconsider the relationship between art, mortality, and immortality. What stands to be lost and gained in this new world?

Bauman (1992) argues that we have entered a new era in attitudes toward death, which no longer finds us prioritizing the medical and ideological conquest of particular forms of mortality, but rather seeking the democratization and deconstruction of *immortality* itself. The new ideology holds that if no one is immortal, everyone is; if we cease to venerate the past and live in amnesiac obsession with the present, then our concern with the (finite) future is simultaneously diminished. Such ideas may seem far-fetched; and yet they

also seem strangely plausible in a milieu of endless news cycles, viral videos, nostalgic repackaging of trends not one decade old, and proliferating technologies that place creativity in the hands of the masses (GarageBand, Photoshop, etc.).

Although it was only a false victory, celluloid film was the culmination of centuries of human aesthetic striving to *preserve* for posterity the actual faces, spaces, and times of human being—to extract valued events and individuals from the tragic run of years, to somehow place them outside the bonds of finitude. Watching the flicker of a reel of silent film in a darkened theater, we remain touched by the pathos of this endeavor. It is unclear what new turns will be taken in the universal quest to redeem death through art. But in an era of proliferating digital capacity, we should perhaps tread especially slowly. We should retain the appropriate level of humility and pride attendant on the recognition that nonbeing shapes the contours of being; that "if the word 'death' were absent from our vocabulary, the great works of literature would have remained unwritten" (Koestler, 1978, p. 18).

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Chapter 23

The Terror Management Underpinnings of Risky Behavior

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Vera, my wife, says to me: "Every fifty minutes somebody dies on the road in France. Look at them, all these madmen tearing along around us. These are the same people who manage to be so terrifically cautious when an old lady is getting robbed in front of them on the street. How come they have no fear when they're behind the wheel?"

What could I say? Maybe this: the man hunched over his motorcycle can focus only on the present instant of his flight; he is caught in a fragment of time cut off from both the past and the future; he is wrenched from the continuity of time; he is outside time; in other words, he is in a state of ecstasy; in that state he is unaware of his age, his wife, his children, his worries, and so he has no fear, because the source of fear is in the future, and a person freed of the future has nothing to fear.

Milan Kundera (1996)

Most individuals have the ability to perceive risks accurately, yet they do not necessarily weigh these risks when deciding whether or not to engage in risky behavior. This familiar fact of life is probably what has sent many scholars on a search for an explanation of why some people tend to endorse risky behavior on a daily basis. Behaviors such as substance abuse, heavy alcohol consumption, unprotected sexual intercourse, reckless driving, or extreme sports are the most common examples of potential threats to one's health, or even life, that are engaged in regularly. Such behaviors can lead not only to substantial losses to self and significant others, but also to unintentional harm to innocent bystanders (Boyer, 2006). What they all have in common is that they entail an action or inaction with a potential for loss (Furby & Beyth-Marom, 1992, p. 3), and that they involve some kind of balance between risk and reward (Zuckerman & Kuhlman, 2000). For the purposes of this review, therefore, the term "risk taking" is used to refer to purposive participation in some form of behavior that involves potential

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negative consequences or losses (social, monetary, interpersonal) alongside perceived positive consequences or gains.

Some conceptual models of risk taking are concerned mainly with personal or personality traits that are associated with taking risks, such as impulsiveness and sensation seeking (e.g., Costa & McCrae, 1992; Eysenck, 1976; Zuckerman & Kuhlman, 2000), while others focus on situational determinants, such as the framing of potential gains and losses (e.g., Kahneman & Tversky, 1979). Still others concentrate on cognitive–social learning theories (e.g., Byrnes, Miller, & Schafer, 1999), which emphasize interactions between individual predispositions and the social context. The first category of theories thus explains the propensity for risk taking in terms of individual differences, ignoring the specific arena in which the risk is undertaken. The second category focuses on situations that promote risk taking as opposed to those that promote risk aversion, without much reference to individual differences. And the third category bases the explanation of risk taking on the interaction between people and situations, arguing that certain people take risks in a particular context because they believe they will succeed and value success in that context (Byrnes et al., 1999; Irwin & Millstein, 1986). Despite the differences, however, all three approaches assume that risk taking is an action, and thus can be observed and reported by the individual or by external evaluators. Moreover, they agree that in most cases, risk can not be attributed simply to lack of knowledge or reduced social skills.

In an attempt to look for more implicit factors which may contribute to risk taking, a number of empirical studies explored the associations between death anxiety and risk taking (Alexander & Lester, 1972; Berman, 1973; Schrader & Wann, 1999; Slanger & Rudestam, 1997; Thorson & Powell, 1990; Warren, 1981-82; Word, 1996). As the findings of these investigations were equivocal, they did not lead to decisive conclusions. However, the introduction of terror management theory (TMT; Greenberg, Pyszczynski, & Solomon, 1997; Solomon, Greenberg, & Pyszczynski, 1991) opened the door for a fresh look at the relationship between death issues and human behavior.

The central issue addressed by TMT is the existential terror aroused in response to awareness of the eventual inevitability of death and how people manage this terror. The core proposition is an anxiety buffering system consisting of two elements: cultural worldview and self-esteem. It is posited that in order to cope with the terror, people cling to a cultural worldview and seek to live up to the standards and values it prescribes. Doing so then gives them the sense that they are valuable participants in a meaningful universe, that is, a sense of self-esteem. These two psychological structures serve as a shield against the existential terror of death. Moreover, studies have shown that reminders of death (usually referred to as mortality salience; MS) increase the motivation to enhance and defend diverse aspects of both components of the anxiety buffer. As TMT was developed further, it became clear that these defensive tactics are of two distinct kinds. The first are

proximal defenses (such as suppression), which are active when thoughts of death are the focus of attention (i.e., they emerge immediately after death reminders). The second are distal defenses, which involve clinging tighter to one's worldview and striving to increase self-esteem. These defenses are evidenced when thoughts of death are accessible, but not the conscious focus of attention. Thus, proximal and distal defenses work together to keep death thoughts at bay (Pyszczynski, Solomon, & Greenberg, 2015). By relating to the importance of cultural worldview and self-esteem as means of defending against the terror of death, TMT provides a unique opportunity to consider the basic motivations which may lie at the core of the relationship between the threat of death and risk-taking behaviors.

The initial studies conducted using the TMT framework aimed to examine the critical role that might be played by self-esteem in the decision to pursue risks (Taubman–Ben-Ari, Florian, & Mikulincer, 1999). More specifically, it was reasoned that as exposure to death reminders may lead people to search for a potential course of action to validate their self-esteem, the perception that a particular behavior is relevant to self-esteem may focus the search on this behavior, even if it entails a degree of risk. Consequently, people may engage in risky behavior because they overemphasize the self-relevant gains (e.g., reckless driving might help individuals to validate their sense of mastery and self-worth and improve their social prestige and status among peers), while turning a blind eye to potential dangers (such as physical harm or death), even if on a rational level they know the behavior is risky and are willing to acknowledge that fact in response to a direct question (Taubman–Ben-Ari et al., 1999). This reasoning is consistent with the unique importance of self-esteem proposed by TMT (Burke, Martens, & Faucher, 2010; see also Chapter 7, this volume).

What started with two relatively small series of investigations into risk taking behind the wheel, has become, in the last two decades, an extensive body of research relating to various risky behaviors. Conducted in different countries on a variety of populations, most studies have led to similar conclusions. Below we review these studies in detail, looking first at those relating specifically to self-esteem or its components, and then moving on to studies that have considered other factors that may serve as moderating variables, most commonly personality traits and gender.

EXAMINING RISK TAKING UNDER THE MICROSCOPE OF TMT: THE ROLE OF GLOBAL AND SPECIFIC SELF-ESTEEM

In the first attempt to understand risky behavior with the aid of TMT, a set of three studies was conducted on over 600 young Israeli male drivers to examine the interrelations between MS, the relevance of driving for self-esteem, and reckless driving intentions and behavior (Taubman–Ben-Ari et al., 1999). The results of the first study indicated that the traditional

MS manipulation (two open-ended questions about death; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989; see also Chapters 1 and 4, this volume) led to higher reported willingness to engage in reckless driving only when driving was perceived as relevant to the young drivers' self-esteem. In contrast, young men who tended to perceive driving as less relevant to their self-esteem reacted to MS with fewer intentions to drive recklessly. Importantly, no significant effect for global self-esteem was found. The results were replicated in a second study using a different MS manipulation: completing the intrapersonal or interpersonal aspects of a death anxiety scale (Florian & Kravetz, 1983). The findings reinforced the results of the previous study by showing that different conditions of MS (regardless of the specific meaning of personal death in each condition) led to a higher self-reported tendency for reckless driving among young men who perceived driving as relevant to their self-esteem. However, unlike the first study, no significant MS effect was found among young men who perceived driving as less relevant to self-esteem. A third study again replicated the main finding, this time using a different outcome variable to measure risky behavior: speed in a driving simulator. After exposure to MS, male drivers who perceived driving as relevant to self-esteem increased their speed in the simulator (Taubman–Ben-Ari et al., 1999).

Following these initial results, two additional studies examined the effects of MS on reckless driving among young male drivers. This time MS took the form of threat appeals in television campaigns aimed at reducing risky driving (Taubman–Ben-Ari, Florian, & Mikulincer, 2000). In the first study, participants assigned to the MS condition viewed a road trauma film, while those in the control condition were shown a neutral film, with both segments presented as part of a TV commercial. All of them then reported on their willingness to react in a reckless and dangerous way to hypothetical driving scenarios. The findings indicated that individuals who perceived driving as relevant to their self-esteem reported lower proneness to reckless driving intentions after the MS condition. A second study using the same conditions measured actual behavior by means of a driving simulator. Here, following the MS manipulation (i.e., the road trauma film), those who perceived driving as more relevant to their self-esteem drove faster than similar participants who watched the neutral film. In contrast, among individuals with low relevance of driving to self-esteem, those in the MS condition drove slower than their peers in the control condition. The authors concluded that although the threat appeal led participants with high relevance of driving to self-esteem to verbally report that they would drive more carefully in hypothetical scenarios (adhering to the social expectation raised by the road trauma film, which mirrored a road safety campaign), in actuality, they drove less carefully in the simulator after exposure to the MS manipulation.

The importance of driving-related self-esteem to young men's intentions to take risks behind the wheel under MS conditions was confirmed in a

series of studies conducted in the UK (Jessop, Albery, Rutter, & Garrod, 2008). Here, participants who were exposed to mortality-related information about the risks of driving had more death-related thoughts than those in a control condition, and those who perceived driving to enhance self-esteem reported significantly higher intentions to drive fast after exposure to this information.

The impact of driving-related self-esteem was tested among motorcyclists as well. In a German study, which also examined the context in which the driving was undertaken (solo vs in a group), bikers with relatively low driving-related self-esteem were unaffected by the MS manipulation in both driving contexts. However, in the solo driving condition, bikers high on driving-related self-esteem scored higher on reported reckless and dangerous driving than their counterparts in the control group, thus replicating previous findings. MS did not have a significant effect on driving in the group condition, implying that being part of a group may serve as a potential protective shield against the negative effects of MS (Ivanov & Vogel, 2017).

The effect of exposure to information about mortality-related risks has also been examined in respect to another type of risky behavior, binge drinking. In a study of UK students, such information led to higher accessibility of thoughts about death (Jessop & Wade, 2008). In a second study conducted in the general population with a wider age range, the influence of MS on the willingness of men and women to binge drink was found to vary as a function of the habitual behavior of the participants. Thus, those who were not regular binge drinkers reported greater willingness to binge drink after MS only if binge drinking conferred benefits on their self-esteem. However, participants who indicated that they typically binge drank at least once a week, that is, those for whom binge drinking was already part of their self-image, reported greater willingness to binge drink following MS than those in the control group, regardless of the level of relevance of binge drinking for their self-esteem.

Likewise, in a study conducted in the United States, participants completed a measure of identity investment in drinking, which can be conceptualized as drinking-related self-esteem, and were asked to react to an antidrunk driving message containing fear appeal, with the fear relating to one of three possible threats: arrest, serious injury, or mortality. Among the participants whose sense of identity involved a high commitment to drinking (i.e., high drinking-related self-esteem), those exposed to the threat of mortality evaluated drunk driving as more acceptable than those who viewed the same message with mortality replaced by arrest or serious injury (Shehryar & Hunt, 2005).

Replicating these findings in a sample of young American men and women, Wong and Dunn (2013) found that after exposure to death-salient antibinge drinking public service announcements (PSAs), participants with high binge drinking–based self-esteem reported more positive binge

drinking attitudes, lower intentions not to binge drink, and greater message avoidance. The same participants also evaluated the claims made in the PSA more negatively than those with low binge drinking–based self-esteem.

Another study investigated the impact on the attitude to smoking of mortality-salient versus nonmortality-salient cigarette warning labels (Hansen, Winzeler, & Topolinski, 2010). Male and female students who smoked first completed a measure of smoker-based self-esteem and were then presented with fear-evoking warning messages on cigarette packages. Some were related to death (i.e., "Smoking brings you and the people around you severe damage") and others were not (i.e., "Smoking makes you unattractive"). After a delay, smoking attitudes were measured, and revealed that smokers with smoking-related self-esteem reported more positive smoking attitudes after exposure to warning labels that were mortality salient. However, the smoking attitudes of participants who based their self-esteem on smoking became more negative when they were shown warning labels that did not relate to death, but to the source of their self-esteem. The authors suggest that such warnings may be particularly threatening to people whose self-esteem is based on the belief that smoking makes them feel valued by others or boosts their positive self-image.

The results of this study were replicated in an investigation focusing on young women's and men's short- and long-run behavioral intention to quit smoking, and their health risk perception of smoking (Martin & Kamins, 2010). Again, the participants completed a smoking-related self-esteem questionnaire and were assigned to one of three conditions: MS highlighting the health dangers of smoking, a social-exclusion message, or a control condition with no particular message. The findings indicated that young people with high smoking-related self-esteem exposed to mortality-salient ads reported lower intentions to quit smoking in the near future than those who watched the social-exclusion message, with no difference compared to the control condition. In contrast, those with lower smoking-related self-esteem reported higher intentions to quit after exposure to the MS than to the social-exclusion message, but not compared to the control condition.

In yet another study directed at examining the effectiveness of antismoking PSAs among young male and female smokers, MS was compared with thoughts about social rejection and alienation by significant others due to smoking and with a control condition (Wong, Nisbett, & Harvell, 2017). Here, too, participants completed a self-report measure tapping smoking-based self-esteem. The outcome variables, measured following a short distraction, related to their attitudes toward smoking and intentions to quit smoking. Again, the results revealed that high smoking-related self-esteem smokers in the MS condition reported significantly lower negative attitudes toward smoking and lower intentions to quit than those in the social condition, and were, in fact, no different from those in the control condition. In contrast, among smokers whose self-esteem was not strongly related to their

smoking behavior, both the MS and social threat messages led to a similar increase in the intention to quit and negative attitudes toward smoking, as compared to the control condition.

Whereas these studies compared the response to an MS and a social-exclusion message, Arndt et al. (2009) examined the effect of the extent to which young adult smokers of both genders smoke for reasons related to social acceptance and image (extrinsic self-esteem). After assessment of this variable, participants were exposed to an MS or control condition. Following a delay task, they were shown a 30-second commercial about the negative consequences of smoking on appearance and social relations, and were then asked to rate the commercial's persuasive impact and report on their intention to quit smoking. The results showed that participants with higher levels of extrinsic reasons for smoking who were exposed to MS expressed stronger perceptions of the commercial's effectiveness and stronger intentions to quit smoking. In other words, following exposure to thoughts of death, when people who were motivated to smoke for affiliation reasons, that is, who needed to feel they belong to a group they value, were told that their social environment does not approve of or appreciate their behavior, they reacted to the threat by embracing the commercial's message in order to save their self-esteem. The authors specifically note that the significance of the findings is not simply that the death reminder increased the participants' intentions to quit smoking, but that only those with high extrinsic reasons for smoking reacted in this way to a commercial which advocated antismoking for social reasons. This implies that in the context of managing mortality concerns, the ramifications of the behavior for the individual's self-worth and social approval may be more important than the behavior itself. The authors predict that people who smoke for reasons pertaining to their image or social acceptance would want to smoke more after MS if such behavior is encouraged by the social group. These findings not only validate the basic premises of TMT regarding the importance of self-esteem (see Chapter 7, this volume), but also highlight the significance of the framing of the threat at hand.

Finally, in an Israeli study, frequent cannabis users who were exposed to a traditional MS manipulation reported higher marijuana craving than those in a control condition (Nagar & Rabinovitz, 2015). Although the issue of self-esteem was not examined in this study, one can assume that for individuals who tend to use cannabis more frequently, this behavior is more relevant to their self-esteem than for those who do not.

Whereas the studies above all related to a specific feature of self-esteem relevant to the behavior in question, a study exploring intentions to use drugs in three different situations—drugs offered in a university study, by a stranger at a party, or by a close friend—explored the role of global self-esteem in high school students' decision to take risks (Hirschberger, Florian, Mikulincer, Goldenberg, & Pyszczynski, 2002). It was found that low self-esteem participants displayed higher willingness to use drugs

offered by a friend following exposure to MS than in a control condition. In the same situation, MS had the opposite effect on high self-esteem participants, who declared less willingness to take drugs in the MS condition than in the control condition. However, the same results were not replicated in the other two scenarios. These findings echo the above reports regarding the social element of risky behavior (e.g., Ivanov & Vogel, 2017; Martin & Kamins, 2010) and its relation to TMT mechanisms. TMT contends that human behavior can be explained by both self-esteem and the need to feel a member of a significant group. The interrelations between self-esteem and group membership appear to have played a role in Hirschberger et al.'s study (2002) as well. More specifically, high school students with low self-esteem were generally more inclined to use drugs and expressed more liberal views toward drug use than those with high self-esteem. The same people were the ones to accept an offer of drugs from a friend following exposure to MS, but did not react in similar fashion to an offer from a stranger or in a nonsocial context (the university study scenario). Thus, when exposed to reminders of their mortality, teens low on self-esteem declared they would use drugs offered by a friend in an attempt to protect their self-esteem and gain a feeling of belonging. In contrast, those with higher global self-esteem were less interested in drugs in the first place, and therefore did not have to protect or validate their self-esteem with the help of this behavior.

A recent study similarly showed that MS increased alcohol consumption at a night club (as measured by a breathalyzer) among individuals with low levels of global self-esteem, but not among those with high levels of self-esteem (Wisman, Heflick, & Goldenberg, 2015). The authors explain that aside from being a risky behavior, drinking serves to reduce self-awareness, especially that which reflects negatively on the self. This is another way of indirectly confirming the claim that exposure to death reminders generates the need to cancel out a negative experience of the self, or a reduced sense of self-esteem, thus causing people to engage in behaviors that may free them from such feelings, even at the expense of risking their health.

Although most studies of risk under MS conditions have dealt with risk taking in the form of substance abuse, reckless driving, smoking, or unprotected sex, one study examined the effects of awareness of personal death among people who engage in scuba diving. Although this is a recreational activity known not only to be fun but to contribute to perceptions of self-efficacy and self-esteem as well, it also entails the potential risk of injury or death. Using a sample representing a wide age range, the study indicated that exposure to thoughts about death increased the willingness of divers with low self-esteem and low diving-related self-efficacy to take more risks than in a control condition. However, among individuals with low self-esteem and high diving-related self-efficacy, death awareness reduced the willingness to take risks (Miller & Taubman–Ben-Ari, 2004).

Bandura (1997) claims that perceived self-efficacy operates as a key factor in judging the risks involved in various situations. In the absence of protective self-efficacy, most situations seem scary and risky. On the other hand, people possessing a high sense of self-efficacy are less anxious, better able to distinguish between risky and safe situations, and more willing to undertake maneuvers that others might consider risky. Moreover, studies have found associations between self-esteem and self-efficacy, such that self-efficacy prospectively predicts self-esteem, although not vice versa (Lightsey, Burke, Ervin, Henderson, & Yee, 2006). This association may explain why divers with low self-esteem reacted to MS with higher intentions to take risks, particularly when they did not perceive themselves to be talented divers. Low diving-related self-efficacy may be seen to reflect lower diving-related self-esteem, which heightened the need to protect the self-following exposure to MS, and therefore to do so through higher risk taking. In contrast, those with low self-esteem who perceived themselves to be competent divers may be expected to have had higher diving-related self-esteem to begin with. Consequently, making them more aware of the risks involved in diving led to lower intentions to take risks.

THE MODERATING ROLE OF PERSONALITY CHARACTERISTICS

A number of studies have considered the role that various personality traits may play in the effect of exposure to mortality cues on risky behaviors. One such trait is locus of control (LOC), which refers to individuals' general perception of events as being under their own control (internal LOC) or under the control of powerful others or other outside forces (external LOC; Rotter, 1966). Interestingly enough, it has been suggested that LOC and self-esteem are interrelated traits and may even be markers of the same higher order concept (Judge, Erez, Bono, & Thoresen, 2002). In one study, MS led both men and women with internal LOC (hence, high self-esteem) to report a lower likelihood of engaging in risk taking, whereas participants with external LOC (hence, low self-esteem) reported being more likely to engage in behaviors such as driving over the speed limit, using drugs, unsafe sex, interpersonal violence, and other potentially dangerous activities (Miller & Mulligan, 2002). These findings are consistent with the idea that individuals with high self-esteem are more protected from the effects of MS (Greenberg et al., 1992), whereas those with lower self-esteem use risk-taking behavior as a means of managing the terror of death.

Another study that focused on reckless driving examined driver's desirability of control as a moderator (Alper & Özkan, 2015). Relatively young Turkish male drivers (aged 18–30) were exposed to a traditional MS manipulation or a control condition, and after a short delay, completed a set of self-report questions concerning their preferred speed and intention to

comply with the speed limit. The findings showed that participants with low control desirability who were exposed to MS preferred to drive at a higher speed and showed less intention to comply with the speed limit than those in the control group. The opposite results, in part, were found for individuals with high desirability of control, where participants in the MS condition reported having increased intentions to comply with the speed limit on rural roads. Other studies examining the associations between desirability of control and self-esteem found that individuals with higher desirability of control also had higher self-esteem (e.g., Gebhardt & Brosschot, 2002). Thus, once again it would seem that people with lower desirability of control—or low self-esteem—react to reminders of death with a higher tendency to take risks.

Another trait which has gained attention is fear of intimacy. A study conducted among Israeli undergraduate students, both men and women, explored the contribution of fear of intimacy and death reminders to risky sexual behavior and found that MS led to higher willingness to engage in risky sexual behavior, mainly among individuals with a low fear of intimacy (Taubman–Ben-Ari, 2004a). In addition, although global self-esteem was inversely related to fear of intimacy, it did not explain the reactions of people differing in fear of intimacy and did not moderate the effects of MS.

THE MODERATING ROLE OF GENDER DIFFERENCES

Gender differences have been examined in several studies, which show systematically that exposure to MS leads to higher risk taking among men, but not necessarily among women. In two studies examining the role of terror management processes in various life endangering activities—rock climbing, engaging in casual sex, and driving fast among US college students and drug use among Israeli high school students—exposure to an MS manipulation increased the appeal of risk taking among men, but had little effect on women (Hirschberger et al., 2002). MS was also found to strengthen the willingness to drive recklessly among Israeli young men, but not among young women (Taubman–Ben-Ari & Findler, 2003). Similarly, a UK study (Jessop et al., 2008) that compared male and female drivers of more diverse ages (19–30) indicated that exposure to information about the mortality-related risks of driving resulted in higher intentions to drive fast among men who perceived this behavior to be beneficial for their self-esteem, but the same results did not emerge for female drivers.

Likewise, in two studies conducted in the United States, men who were primed with mortality (but not a control topic) reported a greater willingness to engage in risky sexual activities (unprotected sex) and wanted more future sexual partners than women (Lam, Morrison, & Smeesters, 2009). A third study in this series used a behavioral measure (choosing a safe gift,

i.e., condoms, or unsafe gift, i.e., a pen) to test whether gender would moderate the relationship between MS and risky sexual behavior. The findings revealed that in the MS condition, men were more likely than women to choose the pen over condoms, whereas no gender differences were found in the control condition. In addition, women's choice of gift did not differ across conditions.

As men are more inclined to engage in risky activities than women (Byrnes et al., 1999), it would appear that the gender-specific component of self-esteem which relates to risky behaviors is stronger for men than for women. In other words, when faced with thoughts of death, the appeal of risk-taking activities is higher for men, as they can use risk taking as a means of validating their self-esteem.

Nevertheless, some studies have not found gender differences in the response to MS. A set of studies conducted in Israel, for example, reported no gender differences in the effect of MS on the willingness to engage in risky sex (Taubman–Ben-Ari, 2004a), and a UK study revealed that the effects of MS on the willingness to binge drink were independent of the participant's gender (Jessop & Wade, 2008). In another study that sought to replicate the effect of exposure to death reminders on risk taking using a mixed gender sample, Israeli male and female students were approached on campus and handed a flier which dealt either with a subject that reminded them of death or with an aversive subject unrelated to death. They were then solicited by another research assistant to purchase a beverage, either alcoholic or non-alcoholic, with only one type of beverage, clearly marked, being offered on a given day. At the end of the procedure, participants were debriefed and asked several basic demographic questions (Ein-Dor et al., 2014). It was found that participants who were exposed to the death prime were significantly more likely to consume alcohol than those who were exposed to the aversive prime, irrespective of gender.

Self-Esteem Risk-Taking—Concluding Remarks

Throughout this chapter, we have consistently seen that exposure to death reminders elevates the level of risk individuals are willing to endorse, and the special role played by their risk-related self-esteem. It is important to note that these effects are not conscious; all the studies mentioned here demonstrate distal effects of MS that occur when thoughts of death are accessible but outside conscious awareness (see Chapter 2, this volume). It is possible that when people consciously contemplate their death, they tend to behave in a manner consistent with risk-aversive, health-protective behavior (see Chapter 17, this volume), both because of social norms and because of their natural will to live. In such a case, people may react to explicit death reminders, such as threat-appeal ads and TV campaigns, by declaring their intention to reduce the risks they engage in in the future

(e.g., Taubman–Ben-Ari et al., 2000). However, when death issues are implicit and/or unconscious (e.g., following a delay), and when the behavior, rather than the declaration, is what is being measured, attempts to avoid the existential fear and remove the threatening thoughts may be reflected in active efforts to symbolically validate one's self-esteem by dangerous means. This may manifest itself in any number of risky behaviors: consuming substances that offer momentary relief (e.g., Nagar & Rabinovitz, 2015; Wisman et al., 2015), even if this relief comes, paradoxically, at the expense of one's health; driving recklessly to gain a sense of being alive and having control (e.g., Alper & Özkan, 2015; Taubman–Ben-Ari et al., 1999), even if this means putting oneself, and others, at greater risk of being injured or killed; or by engaging in challenging and dangerous sports that offer breathtaking sensations and social prestige (e.g., Hirschberger et al., 2002), even at the expense of long-term injuries or worse.

As we have seen, research indicates that when individuals perceive various risky behaviors to be relevant to their self-esteem, MS leads them to asses those behaviors as more attractive and to engage in them more. For such people, the risky behavior probably offers the potential gain of positive self-relevant outcomes that might increase their sense of self-esteem. It can also be inferred from the studies reviewed here that people who engage in these behaviors regularly most likely do so as a means of managing their ever-present fear of death on a nonconscious level. Reminding them explicitly of their mortality has the paradoxical effect of strengthening their immediate need to validate and reinforce their self-esteem, often accompanied by potential additional gains, such as social connections, group identification, and a sense of belonging. With the risky behavior being so accessible, they tend to choose it as their first option to relieve the anxiety elicited by death reminders. On the other hand, for individuals who do not perceive a specific risky behavior to be relevant to their self-esteem, MS appears either to have no effect at all, or to have the reductive survival-oriented effect of avoiding danger. The potential positive outcomes involved in risky behaviors are simply irrelevant to their defensive efforts to increase self-esteem. Such people can be expected to look for other paths to relieve their fears, whether by clinging to their worldviews or by engaging in nonrisky activities that validate their self-esteem.

We believe that all the findings reported thus far concerning risky behavior following reminders of death can be explained in terms of this understanding of the role of self-esteem. Individual differences, whether relating to behavior-specific self-esteem, global self-esteem, gender, or personality traits, can all be seen to be part of the bigger picture, highlighting, from different angles, the same basic conclusion: self-esteem is of overriding significance in the explanation of human behavior.

Indeed, in their 2010 metaanalysis, Burke et al. note that gender and self-esteem have been the two most commonly employed within-study

moderators in all TMT studies over the years. Examining explicit self-esteem measures (all obtained using the Rosenberg Self-Esteem Scale, 1965), they found that the mean effect size of MS was significantly positive for high self-esteem participants, and not significant for those low on self-esteem. On the other hand, gender did not have a unique effect on reactions to MS, with men not differing significantly from women. The only exception to this rule concerned risky behaviors, which appear to be more relevant for men than for women. Taken together, these two findings lend credence to the idea that men and women defend themselves against mortality issues in different ways. The same principle can be applied to different individuals, with each person adopting a different set of behaviors according to what they consider important to their self-esteem.

The contention regarding the critical role played by self-esteem in TMT, and more specifically, in the motivation for risky behavior, is consistent with recent discussions in the literature. Self-esteem is one of the most frequently researched terms in psychology, and is a critical concept in the understanding of human cognitions and behavior (Crocker & Park, 2004). Empirical research has documented the many ways people seek to maintain, enhance, and protect their self-esteem (Baumeister, 1998). Numerous scholars have arrived at the conclusion that the desire to believe that one is worthy or valuable drives behavior and shapes how people think about themselves, others, and events in their lives (e.g., Crocker, 2002; Greenberg et al., 1993; Kunda & Sanitioso, 1989; Leary & Baumeister, 2000; Ross, 2002). For example, the best predictor of satisfaction with positive events has been shown to be their impact on self-esteem (Sheldon, Elliot, Kim, & Kasser, 2001). The pursuit of self-esteem is so pervasive that many psychologists perceive it as a universal and fundamental human need (Allport, 1955; Baumeister, Heatherton, & Tice, 1993; Maslow, 1968; Rogers, 1961; Rosenberg, 1979; Solomon et al., 1991; Taylor & Brown, 1988). Some even maintain that humans evolved as a species due to the pursuit of self-esteem (Leary & Baumeister, 2000; Leary & Downs, 1995).

We began this discussion by defining risk taking as "purposive participation in some form of behavior that involves potential negative consequences or losses (social, monetary, interpersonal) alongside perceived positive consequences or gains." The studies we have reviewed, however, all examine behaviors that carry potential physical harm, rather than any other form of damage. There may sometimes be a fine line between what is considered a risk and what is not. In ordinary parlance, risky behaviors generally refer to those that may endanger health or even result in death. But there is no doubt that risk taking can also be found in other realms of decision making. For example, a person may take an economic risk by investing in speculative shares or gambling, and may take a social risk by asking someone out and opening themselves up to frustration or a sense of rejection if they are turned down. Nevertheless, whether the behavior

involves life-threatening, financial, or emotional risks, it offers an opportunity to gain self-esteem, along with the potential to lose it. Whatever the situation, TMT and the weight it attributes to self-esteem as a central mechanism of human behavior is an effective holistic theoretical framework for understanding such behaviors.

Furthermore, it is important to bear in mind that although we tend to perceive risky behaviors as activities engaged in, refraining from taking action can also incur the loss of social assets, such as status and image. Adopting a more comprehensive attitude to risk taking will enable us not only to better understand the "traditional" risk-taking literature, but also allow us to view the findings presented in other chapters of this book in a different light.

By relating to individuals' basic preoccupation with death as a mechanism driving a lifelong search for the validation and enhancement of self-esteem, TMT casts risk taking as a basic human behavior and reveals its underlying motivation. In addition to affording a sense of thrill and adventure, taking risks may satisfy a wide range of existential concerns and needs, such as enhancing self-worth and validating the sense of belonging. A certain degree of risk taking is considered essential for the development of optimal social and psychological competence, helping to build self-confidence, foster independence and self-regulation, and provide reinforcement for taking initiative (e.g., Baumrind, 1987; Shedler & Block, 1990). Thus, to some extent, risk taking can be perceived to be crucial for identity formation, the construction of value priorities, and the establishment of social status. In other words, risky behaviors may sometimes serve as a positive force. This may be especially true in transitional periods such as adolescence or emerging adulthood (e.g., Deci & Ryan, 2000; Sturdevant & Spear, 2002), when risk-taking behaviors may promote self-confidence and self-esteem, in parallel to their devastating potential. Therefore, while recognizing the potential for loss, we should remember that risk taking also entails a reward, and that the decision of whether or not to engage in a given behavior has little to do with factual knowledge of the risk involved. In other words, perception of risk by itself may be insufficient to prevent risk taking, since avoiding risky behaviors often takes a toll as well, and the benefits of participation may outweigh the potential risks.

The insights offered here can be of practical value. They highlight the benefit of strengthening individuals' sense of worth, and of investing in efforts to change the social climate concerning risky behaviors, which impact the health and well-being of other members of society, as well as the individual. Research points to the importance of inner resources, which may shield from the fear of annihilation when confronted with death awareness (Taubman–Ben-Ari, 2004b). Thus, people with a high sense of self-esteem, self-efficacy, and an internal LOC may be better able to cope with the terror of death without incurring unnecessary risks.

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Chapter 24

Meaning-Making, Communication, and Terror Management Processes

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Have you no hope at all? Do you really think that when you die, you die outright, and nothing remains?

I said: "Yes."

He dropped his eyes and sat down again. He was truly sorry for me, he said. It must make life unbearable for a man, to think as I did.

Albert Camus, *The Stranger*, 1942, p. 73

"When I use a word," Humpty Dumpty said in rather a scornful tone, "it means just what I choose it to mean—neither more nor less."

"The question is," said Alice, "whether you can make words mean so many different things."

Lewis Carroll, *Through the Looking Glass*, 1872, p. 124

Let us consider certain views that may logically be held, and thus settle which of them may conveniently be held; after which I shall hold myself free to declare which of them I intend to hold.

Lewis Carroll, *Symbolic Logic*, 1897, p. 166

What does "meaning" mean? It is a great irony that psychologists, anthropologists, linguists, theologians, poets, painters, and philosophers—those who should know—have such a hard time defining the term. Camus (1955) supposed meaning to be about relation, about connection; he and other existential philosophers would agree that meaning-making is central to the human condition, and that one's individual sense of humanity depends upon

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it. However, aside from providing a number of relatively useful synonyms (e.g., value, relevance, importance, significance, sense, moment, association, connection, relation, correlation, implication, context, reflection, intention, concern, consequence, conclusion, etc.), they all are pretty much at a loss when it comes to defining what meaning means without using the term itself within its own circular definition; for example: Meaning means to have practical bearing upon the world, since without practical bearing there are no experiential consequences, and without experiential consequences, all is meaningless (Peirce, 1878/1992).

MEANING-MAKING

There is one thing about meaning that can be said with some certainty: We humans make meaning by communicating, both within ourselves, intrapersonally, and without ourselves, interpersonally. We make connections, detect signals in noisy environments, identify patterns that may or may not be there, and establish associations in places where they may not necessarily exist, except for the fact that we put them there. We are meaning-makers insofar as we are compelled to establish mental representations of what we expect to see, and then tie those representations (pictures, images, and symbols) together *temporally* to experience our world, to experience ourselves within our world, and to define, practice, and communicate our purpose as we move through time. Meaning is thus essential for all action, experience, and expression. As James (1879) put it, "all meaning, relevancy and purpose are symbolized to our present intelligence in terms of action and reaction and causal efficacy" (p. 22).

We have a burning need to make sense of things so that we may predict outcomes and survive. Much of our communication behavior is focused on these imperatives—gathering psychological information about other people, reducing uncertainty, and estimating consequences. Yet our intellection makes us intensely aware of the randomness, the absurdity, and the potentially meaningless nature of our existence. We are threatened with isolation, annihilation, and entropy, and we use communication and meaning-making to organize our resistance.

By way of communication, all meaning is cultural. Communication is what creates and sustains culture through time, and vice versa. Culture, as a system of knowledge, is passed on to others via the communication processes of enculturation and acculturation; and the system in turn influences our communication via culturally entrained, biosocial, behavioral patterns (e.g., knowing how low to bow, when to avert one's gaze, or when to be acquiescent or assertive, etc.; Kim, 2012).

On an individual level, we cognize by communicating with ourselves—with our different personae—intrapersonally, often in biased and automatic ways designed to boost and maintain self-esteem when valued self-conceptions are

threatened or destabilized (Allport, 1937; Heider, 1958; Heine, Lehman, Markus, & Kitayama, 1999; Tesser & Cornell, 1991). On a cultural level, humans cognize by communicating with each other interpersonally; and again, we often do so in biased ways designed to bolster, maintain, protect, and mutually benefit esteem, self-construal, and face needs (Brown & Levinson, 1987; Goffman, 1955, 1959; Markus & Kitayama, 1991; Ting-Toomey, 1988). Meanings, then, are both within individuals and communal.

Like humans, cultures are meaning-making systems; and similarly, communication is how cultures cognize and recognize meaning. If thinking is a form of internal, intrapersonal communication, then we might view our outward, extra-personal communication as a form of "external thinking." Folklore, literature, history, and cultural memory can be conceived of as special forms of intra-cultural communication, all of which are also subject to the same sorts of self-serving biases favored subjectively at the individual level.

The purpose of this chapter, then, is to consider how communication theory may relate to and inform our understanding of various terror management processes, particularly as they concern the meaning-making systems we use to face, understand, and cope with our everyday world. In addressing a range of domains and situations relevant to communication theory—including interpersonal, relational, organizational and intercultural contexts, as well as various social influence settings—we will adopt Camus' conception of meaning as a way of relating and connecting to the world. Because other chapters in this handbook provide details on the dual-process nature of terror management defenses (see Chapter 2, this volume), we will offer only an abbreviated summary of the theory here. We will then trace some of the themes emphasized in communication theory and research relevant to how terror management processes are motivated and articulated during the everyday routines of social interaction.

TERROR MANAGEMENT PROCESSES

Terror management theory (TMT, Greenberg, Pyszczynski, & Solomon, 1986) holds that two distinct defensive processes are activated to subdue and cope with the inescapable knowledge of one's inevitable death. One process is conscious within focal awareness, and one is preconscious—although salient—outside of focal awareness. The conscious, rational, defensive processes occurrent in focal awareness involve threat-focused, proximal defenses activated to suppress death-related thoughts by distraction, denial of one's vulnerability, or through displacing the menacing aspects of death by pushing them into the distant future (Pyszczynski, Greenberg, & Solomon, 2000) and thereby out of focal awareness. As noted later, communication often plays a crucial role in proximal defenses, particularly by way of distraction (Blumler & Katz, 1974), and denial via defensive attributions (Walster, 1966, 1967), dissonance reduction (Festinger, 1957), bias scanning

(Tice, 1994), third person effects (Davison, 1983), and danger and fear control processes (Witte, 1992).

The preconscious, experiential defensive processes, which occur outside of conscious focal awareness, engage distal terror management defenses primarily involving the investment of faith in one's cultural worldview (CWV), the maintenance of self-esteem (Greenberg, Solomon, & Pyszczynski, 1997), and the cultivation and nurturing of intimate personal relationships (Chapter 10, this volume; Florian, Mikulincer, & Hirschberger, 2002; Mikulincer & Florian, 2000). These distal defenses function to buffer the potential for overwhelming existential anxiety resulting from contemplating the inevitability of one's death, and communication plays a role in these defenses as well, as for example, by way of biased message processing, aggressive verbal displays, affinity seeking, expressions of relational intimacy, role reinforcement, relationship modeling, and social validation.

One of the generative features of the TMT framework is its capacity for yielding insights into a range of human social behaviors, as evidenced by this volume. A communication theory perspective on terror management processes can apply a motivational account of how mortality salience (MS) generates the potential for existential anxiety, which in turn arouses esteem-relevant behavior capable of buffering that anxiety by imparting individuals with a sense of value and worth as defined by their CWV. Hopefully, for many of us, this process can receive an additional assist from the nurturing utility of intimate personal relationships (Mikulincer & Florian, 2000).

Culture and Memory

Humans and cultures have co-evolved such that the physical environment is no longer the dominant one. Thinking, meaning-making, and intellection are communicated at both the individual and cultural levels of existence, with each level depending upon and defining the other. The social world is now the dominant environment. As we think, we communicate in metaphor, which is essentially a cognitive mechanism for understanding complex abstract conceptions in terms of simpler, more comprehensible concrete impressions. More specifically, our conceptual processing appears to be deeply grounded in embodied metaphor, especially regarding our more abstract interpretations of experience (Gibbs, 2005). And so it is with culture and allegory. History, or historical memory, is a reconstruction of culturally relevant "facts" filtered by a worldview (Rodriguez & Fortier, 2007). Historical memories are communicated through art, poetry, narratives, oral histories, written accounts, drama, and ritual, etc. "Like historical memory, cultural memory is rooted in actual events, and in the surrounding and resulting alignments of images, symbols, and affectivities that turn out to be even more persuasive than 'facts' " (Rodriguez & Fortier, 2007, p. 11). Just as various forms of motivated cognition, such as self-serving attributional

biases, function to protect and bolster individuals' self-esteem needs, the dramatizing and mythologizing accumulations of cultural memory serve to uplift and sustain key features of culture by transforming significant events of the past into meaningful aspects of the present.

Self-enhancement and transformation is as vital for the development of cultures as it is for the development of individuals during the adaptive processes involved in enculturation. Moreover, when our culturally enforced, meaning-making efforts are disrupted, we are quite capable of maintaining equanimity by drawing on and reaffirming other more functionally coherent, personally significant meaning-relevant structures (Sheldon & Kasser, 1995), often in areas more easily engaged in than those that may have become unsettled by anomy or alienation (Heine, Proulx, & Vohs, 2006).

THE ANXIETY BUFFERING UTILITY OF CULTURAL WORLDVIEWS

Cultural anthropologists conceive of culture as having both adaptive and cognitive functions. At their most basic level, cultures are systems of socially communicated behaviors that relate human communities to their ecological settings. To survive, humans—as all animals—must maintain an adaptive relationship with their environment (Keesing, 1974). Change within culture is primarily a process of adaptation, along with a certain amount of conflict and disparity in the social order. Adaptation and change take place through the medium of culture, through a process characterized by some as following the same rules of natural selection governing biological adaptation (Meggers, 1971). However, many intercultural, social justice, and critical scholars would likely disagree with this assertion, equating it with social Darwinism, and noting how, for example, colonization has indiscriminately wiped out hundreds of viable cultural systems.

Cultures also function as systems of knowledge that organize all the things its members must know or believe to operate in a manner acceptable to the culture. Hence, cultures do not consist of things, people, behaviors, or emotions, but rather the organization of such things into models for perceiving, relating, and otherwise interpreting them (Goodenough, 1957). Thus, "cultures are epistemologically in the same realm as language (Saussure's langue or Chomsky's competence), as inferred ideational codes lying behind the realm of observable events" (Keesing, 1974, p. 77). In this view, language is a subsystem of culture; and cognitive anthropologists have adapted linguistic methods and models (e.g., structural semantics, emic vs etic perspectives, pragmatic framing, componential analysis, etc.) in their study of various cultural phenomena.

Through communication and language use, cultures dictate and order the frames and schematic representations people use to organize and interpret meaningful experience. Likewise, cultures provide the order and structure

regulating people's responses when such schematic representations are threatened. Although communication theories can address the contextual frames within which various schematic knowledge structures are constructed and transmitted, TMT accounts for why such culturally derived constructions are meaningful and psychologically significant (Miller & Landau, 2005).

From a communication perspective, culturally significant symbols represent the central elements within the shared context of meaning people use to define, understand, and experience the world. From an early age, we are enculturated—taught at home, in school, and through the media—to associate certain important symbols with valued goals and outcomes. Within Western culture, terms such as "freedom," "liberty," "equality," "fairness," and "justice" have taken on an almost sacred quality not to be smeared or profaned, for they describe and define the essence of our Western values. By upholding the standards of an enduring, meaning-conveying worldview, such terms and symbols are the essential elements of a complex psychological mechanism capable of relieving the existential anxiety brought on by our inexorable awareness of death. Moreover, even though we know our bodies must physically perish, we can recast ourselves as spiritual beings, and move the problem of death to a transcendent realm where we may strive for a sense of divine immortality. In a true sense, by procreating and nurturing offspring, we can extend our genetic material into the future, thereby obtaining a more literal form of genomic immortality. Central to all these psychological efforts, defining who we are, and why we are here now, is the symbolic connection between self and culture.

Greenberg, Simon, Porteus, Pyszczynski, and Solomon (1995) investigated how MS (see Chapters 1 and 4, this volume) affects people's willingness to be personally responsible for preserving culturally meaningful symbols. Participants in their study completed death or control primes and then, in an ostensibly unrelated study, engaged in several problem-solving tasks, some of which required using valued cultural icons in inappropriate ways (e.g., pouring ink through an American flag, or using a crucifix as a hammer). In support of TMT, MS resulted in greater hesitation to transgress against culturally revered objects. This and other similar studies demonstrate how MS can stimulate the need for individuals to invest in and declare a deeper commitment to the core symbols of their religious and national values, and hence increases their inclination to favor others like themselves, who share and validate those values, or disfavor dissimilar others who profane, derogate, or otherwise serve to undermine those values.

IDENTITY CONFIRMATION

The importance of other people validating one's worldview, sense of self, and self-worth through confirming responses—and not disparaging or casting doubt upon them through disconfirming responses—is well established in the

communication literature (e.g., Buber, 1957; Cissna, & Sieburg, 1981; Sieburg, 1969; Watzlawick, Bavelas, & Jackson, 1967). Cissna and Sieburg (1981) identify three categories of associative communication behavior that function to encourage identity confirmation, including "recognition," which entails expressing involvement and interest in others; "acknowledgment," which involves expressing agreement (or in some cases disagreement) with others; and "endorsement," which recognizes the validity and significance of others' experience, and their right to express their feelings.

Cissna and Sieburg (1981) also characterize three categories of dissociative communication behavior that function to discourage identity confirmation. The use of disconfirming messages includes the expression of "indifference," which is the functional opposite of recognition, and which discourages involvement by ignoring another's presence, thereby denying their existence; "disqualification," which serves to invalidate another's messages, often by verbal attacks, the use of ambiguous or impersonal language, and/or hostile teasing and mockery; and "impervious" messages, which are the functional opposite of endorsements, and which convey a lack of understanding by denying the validity or significance of another's experience, or by simply asserting the other is mistaken or wrong.

Impervious messages in response to another's self-disclosers violate positive face (Brown & Levinson, 1987; Goffman, 1955) and signify a rejection of the other's identity, particularly when the disclosure involves the other's self-conception. Conversely, endorsements provide verifying feedback confirming another's self-conception as valid, true, and significant (Watzlawick et al., 1967), thereby protecting positive face needs and insuring social harmony. Communication scholars interested in examining a TMT perspective might test whether death thoughts held outside of focal awareness lead to relatively greater confirming responses to messages from similar others sharing one's CWV, or relatively greater disconfirming responses to dissimilar others holding a competing CWV.

Moreover, because MS can increase discomfort for individuals performing behaviors that contradict values relevant to their CWV (Greenberg et al., 1995), for those committed to the values of tolerance and equality—especially when those values have been primed—MS may increase acceptance of dissimilar others (Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992). Thus, a further TMT prediction concerning confirming and disconfirming communication might hold that such responses will be attenuated or eliminated to the extent self-esteem relevant aspects of one's values concerning equality, fairness, tolerance, and other related standards integral to one's moral character are primed before death thoughts are made salient. Just as thoughts of death may be primed daily by news accounts and television shows, so too may principles of tolerance, acceptance, and equality be primed; thus, the media also function to provide terror management defenses, at both the proximal and the distal levels of awareness.

USES AND GRATIFICATION

A central concept within the tradition of symbolic interactionism (Cooley, 1902; James, 1890; Mead, 1934) is that one's self-concept is the reflexive product of social interaction, and the communal, moral, spiritual, symbolic, and physical (nonverbal) functions of human language. Likewise, our collective worldview is the experiential and cognitive product of social interaction. Using an attribution perspective, Epstein (1973) analogously defines the self-concept as a theory one holds about one's self as an experiencing, functioning being interacting with the social world. However, in a motivational sense, Epstein would regard individuals as less interested in theory testing, and more in need of protecting and self-affirming various social identities and self-attributes developed during the process of social interaction.

Blumler and Katz (1974) have developed a uses and gratifications approach to understanding how the mass media can be used to address these self-relevant needs. Uses and gratifications theory (U&G) has produced a considerable literature addressing the utility of various mass mediated channels, particularly television (Rubin, 1983), and more recently, the Internet (Larose, Mastro, & Eastin, 2001; Ruggiero, 2000), cell phone use (Leung & Wei, 2000), and social media (Whiting & Williams, 2013). Like TMT, and Epstein's (1973) conception of the self, Blumler and Katz (1974) note how various self-processes are motivated, and how the developing self uses the media as a means of comprehending culture and fostering a sense of security through identification with a larger social meaning system.

Following Cooley's (1902) notion of the "looking glass self," U&G highlights the importance of the media in emphasizing how reasoning, identity, and the self-concept emerge from the dynamic interaction between individuals and their social environment. Specifically, the media promote growth by offering the perspective of a "generalized other" to help individuals perceive and evaluate themselves, their status, their relationships with others, and their behaviors, even to the extent that some will form parasocial relationships with media personalities (Horton & Wohl, 1956) and engage in parasocial interactions, thinking of media personalities as interpersonal friends (Rubin, Perse, & Powell, 1985). More generally, the media are used to gain self-insights by helping individuals model normative behavior, identify with valued others, and reinforce personal standards (McQuail, Blumler, & Brown, 1972).

The media giveth, and the media taketh away. Relevant to terror management processes, various forms of media play a critical role in shaping our proximal defenses by offering a variety of effective means for distracting us from the insistent problem of death—which presents itself daily via that self-same media. As death is continuously being made salient through the media, by both news and fictional programming, we can rely on all aspects of traditional and social media, whether television, computers, or smartphones, to

provide the ultimate distraction. During particularly stressful times, a TMT perspective would predict increased channel and web surfing away from news stories and programming with morbid or mortality-relevant content toward more frivolous distractions. In support of this prediction, there were significant increases in video rentals and prime-time television viewing by Americans in the weeks immediately following the 9/11 attacks (Brockes, 2001).

By functioning to insulate individuals from the constant presence to death-thought-inducing stimuli, using media as a distraction might be characterized as escape coping, or avoidant, emotion-focused coping. By "tranquilizing oneself with the trivial" (Kierkegaard, 1849/1954), people can use media to sidestep the psychologically menacing prospect of death. But as proximal defenses against conscious thoughts of death, such distractions, even if generally effective, offer only a temporary solution, since a more pressing existential problem concerns the need for distal defenses against preconscious death-though awareness (DTA).

The media are not limited to functioning merely as a distracting form of proximal defense. By reinforcing important symbols, normative behavior, and other means of re-establishing a secure system of meaning and worth, the media can provide source material for reinforcing distal defenses as well. Media consumption can afford a useful method of anxiety reduction by creating grounds for affiliation and in-group solidarity, but it might just as easily function to generate the basis for out-group discrimination, as one might expect from the potentially polarizing nature of media bias (Martin & Yurukoglu, 2016; Prior, 2013), or by the reinforcement of negative racial stereotypes in sitcoms, newscasts, and movies (Horton, Price, & Brown, 1999; Park, Gabbadon, & Chernin, 2006; Van Gilder & Massey, 2016).

Other more therapeutic uses of the media may function at both proximal and distal levels by punctuating daily life with cultural background noise and parasocial companionship, and providing relaxation and an intrinsic sense of cultural and aesthetic enjoyment (Miller & Landau, 2008). From both U&G and TMT perspectives, the most significant function of the media may be through their influence on key relational issues associated with CWV maintenance. By establishing common grounds for talk, face-to-face conversation, discussion, and value clarification, and by modeling family solidarity, as well as physical, verbal, and social media contacts, a key function of media consumption may be established through role reinforcement, relationship modeling, and intellectual validation (Miller & Landau, 2008).

Based on Florian, Mikulincer and colleagues' evidence of the anxiety buffering utility of close personal relationships (see Chapter 10, this volume), and how contemplating one's death can elicit relationship striving (Florian et al., 2002; Mikulincer, Florian, & Hirschberger, 2003), Semmler (2016) provides evidence that DTA can elicit parasocial relationship striving with fictional media characters, such that parasocial relationship interactions may

functionally complement real interpersonal relationships, in part by boosting self-esteem (Derrick, Gabriel, & Tippen, 2008). Moreover, Semmler (2016) notes how parasocial interactions need not be limited solely to media characters with elaborately constructed personas. Citing Giles (2002), Semmler suggests interactions with actual friends and acquaintances may also function as parasocial interactions when facilitated by social media sites, such as Facebook, Tumblr, Twitter, and Instagram, which are ubiquitously available via laptops, tablets, and smartphones, making them convenient instruments for alleviating existential anxiety.

A few potentially fruitful research directions for communication scholars might be to explore to what extent individuals increase their efforts to confirm their self-concepts, boost their self-esteem, validate their worldviews, and reinforce the strength of their close personal relationships through various media channels—television, Internet, smartphone, and social media—following major traumatic events, such as tragedies, terrorist attacks, or national disasters. Another avenue might be to examine the extent to which media use can reinforce traditional gender stereotypes (e.g., males as status-conscious leaders; females as image-conscious nurtures), and how stereotype threat (Steele & Aronson, 1995) may increase state anxiety and impair communication performance (McGlone & Pfiester, 2015), especially within contexts where mortality is made salient.

MOVEMENT, LANGUAGE, AND TIME

In reflecting on how movies can imagine and portray the "larger view" of how humans navigate the cultural dynamics and historical events affecting their lives, Combs (2010) notes that humans, as "homo temporalis" or "homo historicus," have become aware of "our being in time—existential time, rhythmic earth and solar time, social time, historical time, and perhaps even cosmic time" (p. 229) as we move with effort and purpose toward some form of consequentiality. As Combs puts it, we are beings with a certain foreknowledge of temporality, imagining the future and yearning to endure, living rhythmic and episodic lives both as individuals and as tribes.

From a communication perspective, our ancient ancestors, perhaps unable to conceive of a continuous existence over extended time, would have expressed a larger and longer view of life via narratives and symbolic activities conveying supernatural connections, and likely some form of afterlife. Aware of our temporal self-placement, we have the existential desire, along with the imaginative capacity, to yearn for some form of permanence. Our culture is not a static state or place, but rather a conveyance along a passageway in a direction we wish to travel (Combs, 2010). Our "way of life" indicates the path we wish to take as we move toward some desired future, and our language use helps us maintain our direction. Indeed, culture and civilization are products of the human capacity for linguistic communication,

without which, human social interaction would be fundamentally different (McGlone & Giles, 2011).

All human communication codes follow distinct temporal processes, forming rhythms and tempos and patterns in time. The temporal or chronemic aspect of our everyday interactivity links all the other areas of our nonverbal behavior—the proxemic, kinesic, oculesic, vocalic, haptic, olfactic, and gustatory segments of our lives—into a unified, interrelated, dynamic communication process (Bruneau, 1980). Of special significance concerning terror management processes, is how the chronemic and kinesic channels are powerfully and intimately connected.

McGlone and Harding (1998) have noted how the linguistic terms we use to describe movement and spatial position are also used to describe the passage of time, and these conceptual equivalences are reflected in the language we use to denote relations within both domains. For example, phrases such as "the minutes seemed to be creeping along," "the time just flew right by," "the future lies directly ahead," and "wherever has the time gone?" illustrate this correspondence.

McGlone and Pfiester (2009) note how, because time is conceived of as unidimensional and directional, temporal relations are based only on a subset of those relations used for the consideration of spatial location and motion. As time is unidimensional, only those spatial terms assuming one dimension have a temporal correspondence; for example, adjective pairs such as long/short, and stretched/contracted make temporal sense, but those such as deep/shallow, and elevated/lowered do not (at least, not in a pragmatic sense), since the latter pairs presuppose two or more dimensions. Similarly, because time is directional, such ordinal, spatial terms as before/after and near/far work in a temporal sense, whereas symmetric terms such as left/right and above/below do not (McGlone & Pfiester, 2009). From a communication standpoint, the question becomes, when do people adopt one perspective over the other? Or more interestingly, from a psychological standpoint, *why* do people adopt one perspective over the other?

A key contextual factor influencing temporal agency involves one's affective orientation toward the referent event being considered (McGlone & Pfiester, 2009). As seems intuitive, we tend to assign temporal agency to ourselves when the referent event is positively valenced (e.g., we're getting close to success), whereas we tend to assign temporal agency to the event when the referent event is negatively valenced (e.g., trouble is approaching). Thus, the language we use to assign temporal agency tends to follow the same sort of approach/avoidance scheme associated with all our affective responses, whereby we think of ourselves as symbolically approaching positively valenced events, but conceive of negatively valenced events as moving toward us. Moreover, the language choices and metaphorical nature of temporal agency appear to occur largely outside of conscious awareness, both for the speaker and for the hearer. Furthermore, when the differences

between human- and event-agent metaphors are explicitly pointed out, most people, having never noticed or contemplated the distinction before, express confusion and puzzlement about how the distinction is drawn (McGlone & Pfiester, 2009).

The preconscious nature of the effects of temporal agency on communication behavior suggests a potentially useful application of TMT, which McGlone and colleagues have begun to explore. Using TMT and socioemotional selectivity theory (SST; Carstensen, Isaacowitz, & Charles, 1999), McGlone and Merola (2016) examined the effects of MS on temporal agency as revealed in people's spontaneous language use. Briefly, SST posits that goal pursuit is predicated on the nature of one's temporal orientation, or more specifically, on the temporal horizon one perceives and holds. If one perceives time as open-ended, or relatively unlimited, as for instance young people generally do, then goal pursuit tends to be oriented toward experience seeking, information gathering, and engagement in activities with longer-term payoffs. On the other hand, when individuals perceive of time as closed-ended, or relatively more limited, as for instance older people, and individuals facing threats, or approaching imminent life transitions generally do, then goal pursuit tends to be oriented toward maximizing positive affect, minimizing negative affect and interpersonal strife, and engaging in activities with more near-term, positive, emotional rewards (Carstensen, 2006).

McGlone and Merola (2016) reasoned that if one considers death to be the ultimate close-ended temporal orientation, then MS should induce a time-limited, close-ended perspective encouraging individuals to minimize negative affect, and thus temporarily increase language use associated with avoidance-oriented, event temporal agency, and decrease language use associated with approach-oriented, human temporal agency. After manipulating MS (vs dental pain salience) and providing a distractor task to help remove death thoughts from focal awareness (see Chapter 4, this volume), participants were asked—in neutral terms with respect to temporal agency—to write a description of both positive and negative events they thought might be occurring in their lives within the next 6 months. McGlone and Merola (2016) conducted a content analysis identifying references to temporal movement, and trained coders to evaluate them in context, coding both the valence of the referenced event as either positive or negative, and the temporal movement as either assigned to human agency or event agency.

Consistent with McGlone and Pfiester (2009), McGlone and Merola found people across both conditions significantly more likely to assign event relative to human agency for negative events, and significantly more human relative to event agency for positive events. Moreover, consistent with SST, and as predicted by TMT, participants in the MS condition, holding a close-ended temporal horizon, described a proportionally greater number of events using event agency relative to human agency, whereas the proportion of event to human agency descriptions in the control condition was not

significantly different. These findings comport with other conclusions regarding the nature of temporal agency within health communication narratives involving death, where there is greater event agency assigned to death (e.g., "death is approaching"), and greater human agency assigned to the dying (e.g., "she is drawing closer to the end") in such narratives (Chen, McGlone, & Bell, 2015).

Other evidence for the influence of MS on communication and language use is provided by McCallum and McGlone (2011) who—following Goldenberg et al.'s (2001) conclusions about the existential problems posed by human creatureliness (see Chapter 9, this volume), and how reminders of one's corporeality can engender disgust—found the language people use to describe bodily processes varies as a consequence of DTA. Specifically, McCallum and McGlone (2011) found MS to increase the use of euphemisms to describe bodily processes, presumably, as a method of coping with death anxiety through psychological distancing. In their study, reminders of death affected how participants described images depicting creaturely functions. Of note is how participants were led to believe their descriptions would be read by other participants, and thus would serve a communicative purpose. Relative to controls, those in the MS condition used more euphemisms and attempts at politeness to describe bodily functions, such as urination, defecation, and copulation (e.g., "making water," "going number two," "hooking up").

McCallum and McGlone speculate that when mortality is salient, the use of euphemisms may serve to distance individuals both communicatively and psychologically from their creatureliness. Consistent with Goldenberg, Pyszczynski, Greenberg, and Solomon's (2000) conclusions regarding the problem of the body, and the need for humans to cognitively distance themselves from animals, McCallum and McGlone's (2011) findings suggest the use of euphemisms may serve as a mechanism of creaturely dissociation that is useful in communicatively managing the existential anxiety generated by contemplating one's death. Similarly, the ways in which people use language to describe their impressions, feelings, and emotions may provide insight into death-thought processing and subsequent terror management defenses.

AN ALTERNATIVE MEASURE OF MORTALITY SALIENCE

When manipulating MS, terror management researchers are faced with a sort of methodological catch-22 in their attempts to experimentally induce and then verify the presence of death thoughts outside of focal awareness. One way to induce DTA is for an experimenter to first engage participants in a conscious task, such as having them write a couple of paragraphs on how thinking about their death makes them feel, and what they will experience during the process of physically dying. Following such a task, and before DTA can be assessed, one or more cognitive distractions are typically used to help

participants move from proximal to distal defense. The experimenter then attempts to gage the presence of death thoughts beneath the participants' liminal level of awareness without the participants' direct, conscious assistance.

Because self-report measures are inappropriate for assessing death thoughts outside of focal awareness, indirect methods, such as a word-stem completion task (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994), lexical decision task (Arndt, Cook, Goldenberg, & Cox, 2007), or an implicit association test (Bassett & Dabbs, 2003) must be used. Such manipulations checks fail upon occasion, even though MS has been successfully induced, as indicated by other outcome measures. Considering this quandary, certain communication research methods may provide useful tools for exploring the complicated cognitive architecture associated with terror management defenses.

DIMENSIONS, LEVELS, AND VARIABILITY OF DEATH-THOUGHT AWARENESS

As mentioned, to induce MS within lab experiments, participants are often asked to write two essay paragraphs in response to two death-related questions; the first asking to, *"please briefly describe the emotions that the thought of your own death arouses in you,"* and the second asking to, *"please jot down, as specifically as you can, what you think will happen to you as you physically die and once you are physically dead."* The purpose of writing these two essay paragraphs is to induce MS by encouraging participants to subjectively engage in experientially processing the concept of their own personal death. In response to the first of the two prompts, participants are encouraged to provide descriptions of their feelings and emotions about death. Take, for example, the following participant's response to the first MS essay prompt:

> *Thinking about my own death is terrifying and depressing. I don't usually like to think about my own death because it does make me feel really depressed because I don't feel I have fully lived life yet. I think I would feel scared and sad when experiencing my death. Mostly, I would feel sad because of all the people I am leaving behind and all the things I am going to miss out on after I die*

Reading the response above would seem to imply the prompt is inducing feelings of existential anxiety as expressed by words such as "terrifying," "depressing," "scared," and "sad." However, consider the following response provided by another participant to the same initial prompt:

> *Dying though itself is not scary to me because I know that I will live an eternal life in heaven with God. During death I would expect it to be peaceful and hopefully sudden. Even if it was a death that was slower I feel like because I am not scared of death there is a peace that I would still feel.*

Taking this second response at face value, the participant seems to have a culturally relevant "out" in the form of a literal afterlife, and thus might be less affected on an instinctive level by the specter of death. Nothing in this second response hints at the presence of existential anxiety. On the contrary, the participant mentions peace as opposed to terror at the prospect of death. In comparing this second response to the first, it appears people consciously think about death in very different ways, yet, in these two cases, both participants would nonetheless be grouped within the same MS condition. Another consideration involves the different kinds of responses elicited by the two MS prompts. Whereas the first is designed to elicit feelings and emotions, the second one presses participants to further consider the carnal process of dying, which may include references about pain, suffering, and organ failure on the one hand, or a more transcendent process where the soul rises to an everlasting afterlife, on the other. In either case, significantly differing levels of existential anxiety might be expected.

Interestingly, as a by-product of the experimental paradigm, researchers typically discard the content of essay responses without further analysis (although see Friedman & Rholes, 2008; Kastenbaum & Heflick, 2010; Lambert et al., 2014). Consequently, the rich textual content describing the finality of death, or the infinitude of the afterlife—essentially the obverse of death—is lost. Categorized simply as DTA, a range of distinctly different death conceptions expressed by terms, such as "eternity," "the underworld," "the end of consciousness," "fear," "anxiety," "peace," "grief," "rotting skin," "rising souls," "the end of existence," "decomposition," and "infinity," are confounded and unobserved as participants are collapsed into a single MS condition for use as a grouping variable in statistical analyses. Lost in the process are the evocative (in many cases, "haunting") descriptions provided by participants that could inform researchers about how each is individually processing his or her own subjective thoughts and feelings about death and the process of dying.

Several studies (Florian & Kravetz, 1985; Florian, Kravetz, & Frankel, 1984) have identified different dimensions associated with individuals' fear of personal death. Florian and Mikulincer (2004) suggest such research highlights "the importance of a multi-dimensional approach to the fear of death and the need to assess not only the intensity of a person's global and undifferentiated fear, but also the diverse meanings he or she attaches to death" (p. 62). By content analyzing MS essays, researchers may be able to gage the depth of death-thought processing as well as differentiate its qualitative aspects, some of which should be expected to result in higher levels of existential anxiety—such as intuitive, experientially processed visceral responses—and some in lower levels—such as would be expected from more reasoned, cognitively processed, spirit- or religion-based responses.

CONTENT ANALYSIS

Neuendorf (2002) describes content analysis as a communication research technique focused on messages as the unit of analysis rather than individuals. Methodologically, content analysis is like survey research, with an emphasis on isolating cause-and-effect relationships between variables. However, whereas a survey samples a population of people, a content analysis samples a population of messages. Once such a sample is gathered, coders are trained (or applications are programed[1]) to rate each message using custom-designed, continuous measures. When computed, the resulting content scores can be used to predict dependent outcomes, connecting message content with individual effects. Applied to the use of death essay manipulations in TMT research, content analyses can be used to examine descriptive responses to predict the depth and tone of participant DTA within and across experimental conditions. Moreover, such analyses could be used to reveal subcategories of DTA within the MS condition, each of which may predict unique outcomes.

Given that participants are asked to write essays describing their feelings and thoughts about death, the established procedural method for many TMT studies is ideal for content analysis, with each study generating its own intact sample of messages about death-thought processing. Moreover, content analysis follows the same power guidelines as any parametric statistical test, meaning when researchers collect enough responses to conduct tests of differences on dependent variables, they should also generally have enough responses to predict outcomes or test for differences within essay response conditions. What is needed for successful content analysis is a validated and reliable coding scheme (Hayes and Krippendorff, 2007; Krippendorff, 2004) for which there has been some initial study within the context of TMT research.

Coding scheme validation. Within the terror management literature, only a relative few published studies have attempted to analyze MS essay material in a systematic manner (e.g., Friedman & Rholes, 2008, who compared high vs low religious fundamentalists on CWV bolstering; and Lambert et al., 2014, who examined the effects of MS essay manipulations on self-reported fear and anxiety). Kastenbaum and Heflick (2010) examined MS responses to identify recurrent themes and narrative structures. Although Kastenbaum and Heflick's "sorrow-management" framework observed variability within MS essay responses, their approach to analyzing such responses was more

1. Content analysis software packages such as Atlas.ti, DICTION, MaxQDa, and NVivo variously allow researchers to import video, audio, and text files for counting and coding words using auto- or custom coding functions, as well as building visualizations of relations between codes, and comparing them on logic, semantic, and structural levels.

in-line with inductive theory building, as opposed to assessing the nature of MS manipulations used by TMT researchers.

Florian and Mikulincer (2004) used an open-ended essay response exercise to better understand how personifications of death may affect DTA. In a two-stage study, participants first provided brief written essays describing how they perceived death. Based on a content analysis of their essays, they were then grouped into four death categories (i.e., macabre, gentle comforter, automaton, and gay deceiver) according to Kastenbaum and Aisenberg's (1972) scheme.

In the second stage of their study, several weeks later, Florian and Mikulincer exposed participants to either an MS or control essay induction to see how their previous personification of death affected CWV bolstering (via severity ratings of 10 cultural transgressions), and found a significant interaction between MS and death personification. Examination of the simple effects revealed the MS induction resulted in CWV bolstering only for those who had previously personified death in macabre terms, the sole category in which death is visualized as repulsive and anxiety arousing. Because the other three death categories involved visualizing death as more reassuring and understanding, Florian and Mikulincer (2004) reasoned this likely had a comforting effect, making the activation of cultural anxiety buffers less necessary in response to DTA.

More recent work using content analysis has attempted to validate an a priori coding scheme for use in content analyzing MS essay responses. Using a random sample of MS essay responses pulled from two pilot studies, Massey and Miller (2016) trained coders to score MS essay responses according to the category of death language used (coding as 0 = does not mention death, 1 = death mentioned in a purely physical context, and 2 = death mentioned in a spiritual context), the level of spiritual/physical death language found (ranging from 1 = extremely physical, to 5 = extremely spiritual), and the level of anxiety expressed (ranging between 0 = no anxiety, to 3 = extreme anxiety). Krippendorf's α calculated inter-rater reliability for anxiety related to death ($\alpha = 0.89$), level of spiritual versus physical language ($\alpha = 0.94$), and spiritual versus physical death categories ($\alpha = 1.00$; i.e., complete agreement). Analyses between categories revealed both prompts to be significantly correlated with scores for physical/spiritual language, and statistically significant differences between death categories indicated clear qualitative differences between essay responses. Moreover, essay scores for existential anxiety on the first MS essay prompt significantly predicted completion scores on a death word-stem completion task. Results indicated that for every two-point increase in anxiety scores, participants completed an average of one additional death-word fragment, demonstrating how content analysis of MS essays can serve as a manipulation check of DTA outside of focal awareness prior to both proximal and distal terror management defense.

These findings suggest a potentially useful avenue of analysis, whereby essay responses may be used as a predictor of existential anxiety without the risk of a postdistractor task, self-report measure bringing death thoughts back into conscious focal awareness. Beyond indicating how significant qualitative distinctions can be identified within essay responses, these findings suggest how researches might use content analysis to specify several subcategories, along with varying levels of intensity within the MS condition, which might uniquely influence terror management processes, such as investment in intimate relationships, self-esteem bolstering, and the need to maintain and uphold a functional CWV.

THEORY OF CROSS-CULTURAL ADAPTATION

Much of intercultural communication theory is built upon the premise that one's ability to communicate in accordance with the norms and dictates of one's local culture lies at the very heart of successful adaptation (Kim, 2001a). Intercultural communication researchers have empirically demonstrated how, during the process of cross-cultural adaptation, individuals seek opportunities to chart their own personal paths of development in self-expansive ways, allowing themselves to grow beyond the familiar, to deeper, more comprehensive understandings of the human condition (Gudykunst & Kim, 2003).

In *Becoming Intercultural*, Kim (2001a) introduces an integrative theory of communication and cross-cultural adaptation stemming from a general systems perspective, which, at its core, explains how cross-cultural adjustment and cultural identity transformation emerge from macro-level processes, such as cultural and institutional patterns of the host culture. Together, such adjustments influence individual and group adaptation within micro-level processes, such as individuals' unique communicative and psychological behaviors. Addressing the motivation to adapt to one's cultural surroundings, intercultural researchers have used Kim's framework to explore specific types of interpersonal and mediated communication that can hinder or facilitate cross-cultural adaptation.

At a primary level, the theory attempts to understand the nature of the adaptation process individuals undergo over time, and explain why some people are more successful than others in attaining a satisfactory level of psychological fitness during the process of adapting to a new host culture. Kim (2001b) addresses these issues by proposing a stress–adaptation–growth model premised on the idea that humans are profoundly adaptable. Kim's model holds that individuals who enter a new cultural environment will feel a discrepancy between their inner world and outer environment. This mismatch, or lack of equilibrium, causes stress, which in turn encourages individuals to adapt to their cultural environment through acculturation (i.e., learning essential aspects of their new culture). The stress–adaptation–growth model

predicts as one adapts, feelings of stress decrease, which encourages more adaptation, and less stress.

Over time, successful adaptation leads to functional fitness and increased psychological health. Through successful adaptation, individuals develop an intercultural identity as they reconcile contradictory symbolic meaning-making systems. Per Kim (2001b, 2006), intercultural personhood reflects the psychological profile of individuals who might be considered less stereotypical in their thinking—or what Kierkegaard (1846/1992) would refer to as more *authentic* in their philosophical perspectives. As such, intercultural personhood identifies one as a unique individual, as opposed to a member of a specific cultural or ethnic group. In this view, the intercultural person expresses a more universal identity orientation as she or he transcends specific cultural (if not necessarily ethnic) affiliations, and ideally comes to identify with the superordinate social group, *human being*.

Kim's (2005a) integrative communication theory (ICT) is premised on the idea that being a cultural outsider causes psychological stress, which, when strong enough, can cause profound changes in personality as one's psychological equanimity is disrupted. A TMT perspective would suggest such stresses are due to the destabilization of one's CWV as it undergoes a transformation from one cultural standpoint to another. Placing Kim's framework within the scope of TMT, we might speculate that the underlying motivation to adapt to a host culture is to gain a more stable, relevant, and tenable CWV within the new social environment, so as to more effectively buffer existential anxiety.

One of the criticisms of ICT is the implication that, to become fully acculturated into a new worldview, successful adaptation requires people to forsake important aspects of their individual cultural origins, which could conceivably generate anomy and anxiety. Kim's systems perspective might counter this criticism by noting how people adapt only to the degree needed to develop psychological equilibrium within their host environment. In other words, individuals are predicted to adapt their CWV only to the extent they feel comfortable within their new culture. This is to say, if they feel secure having been integrated within the greater host culture, the footing of their modified CWV should stabilize, and less adaptation should be required. On the other hand, if they are living more on their own, cosseted within the new host culture, relatively more adaptation would be required. In any event, adaptation should proceed until a new, more secure, cohesive, and effective CWV has been established.

Consistent with TMT, ICT posits the need for a relevant and functional CWV to be essential for both psychological and social well-being (see Chapter 14, this volume). Exploring culture from a different vantage however, ICT focuses on cross-cultural adaptive processes and their effects on subsequent behavior. Together, both frameworks highlight several potential avenues for future TMT research. Experimental research demonstrates how

MS motivates a need to bolster one's CWV as a means of buffering existential anxiety; whereas, ICT stresses how one's CWV is malleable and subject to change as it adapts to the dynamics of shifting social and environmental imperatives. As one's CWV buffers existential anxiety, the processes of adaptation and acculturation should generally be expected to create greater levels of existential stress for those seeking to immigrate from one culture to another, relative to those already securely enculturated within the host culture. But for immigrants, clashing cultures may not be the primary challenge.

A CONTEXTUAL THEORY OF INTERETHNIC COMMUNICATION

Ethnicity is a distinct yet interrelated component of the more complex concept of culture. Culture is a learned system of knowledge used to interpret and understand the world, providing life with meaning, purpose, and value. Ethnicity, on the other hand, is more simply defined as the implicit, subjective perception of one's place of origin—one's roots (Alba, 1990). In essence, ethnicity is not so much a conscious perception as it is a preconscious appreciation, in part established and identified by the intrinsic characteristics of one's language and race. Whereas culture is learned, ethnicity is tribal; whereas culture holds the future and past within the present, ethnicity is more about one's origin (Alba, 1990). It is defined by kinship and bloodlines stretching back generations. One may adapt a new cultural system with more or less difficulty, however, changing one's ethnicity, almost by definition, would seem to be impossible, as the essential components of ethnic identity—one's racial makeup, primary language, and ancestral homeland—cannot be changed. Indeed, the characteristics of ethnic groups endure with relative stability across time (Nash, 1989), and the boundaries between groups tend to be rigid (Bobo, 1999). Consequently, interethnic conflicts are often extreme and persistent in nature (Čehajić-Clancy, Effron, Halperin, Liberman, & Ross, 2011). Together, cultural and ethnic identifications affect the way individuals communicate with and behave toward one another.

The influence of ethnicity in message processing has been the subject of much investigation by intercultural scholars (Giles, Bourhis, & Taylor, 1977; Gudykunst, 1993; Ting-Toomey, 1993). Kim's (2005b) contextual theory of interethnic communication (CTIC) predicts the communication behavior of individuals as they engage in interethnic encounters across intrapersonal, interpersonal, intergroup, and international contexts. Pertinent to terror management defenses, one CTIC theorem posits interethnic behavior in large part to be a function of the amount of environmental stress present in a given encounter. The theory predicts, "the greater the competition intensifying environmental stress, the more dissociative the communicator's interethnic behavior" (2005b, p. 340). Similarly, realistic and symbolic threats (Stephan, Ybarra, & Morrison, 2009) stemming from drastic events in society, such as

the 9/11 attacks, and other acts of terrorism, have been shown to produce particularly high levels of existential anxiety, causing intergroup relations to deteriorate (Das, Bushman, Bezemer, Kerkhof, & Vermeulen, 2009; Landau, Johns, & Greenberg, et al., 2004; Pyszczynski, Solomon, & Greenberg, 2003), a finding consistent with Kim's predictions about environmental stress.

More recently, with the number of refugees, displaced people, and asylum-seekers at its highest since World War II (Tomkiw, 2014), for many Europeans and Americans, the mere thought of large numbers of refugees entering the country form war-torn regions has been the source of much interethnic unrest, and political turmoil (Nanda, 2016; Schlueter, & Scheepers, 2010), as the sudden influx of refugees has been shown to disrupt power balances between ethnic groups, sparking conflict (Krcmaric, 2014). Considering the nature of 24-hour news cycles, the increasing salience of Islamic terrorism in the American psyche, and the global refugee crisis, chronic levels of environmental stress may become more and more common in the near future, as images of violence and ethnic strife are projected across media platforms.

Considering global trends, and considering the nature of both interethnic harmony and discord, the CTIC observes individual behavior along a continuum running from the associative (confirming, friendly, and open) to the dissociative (disconfirming, hostile, and closed). Within this continuum, behavior is delimited in terms of encoding, which is sensitive to consonance and dissonance, and decoding, which concerns individuation and categorization. Within dissociative decoding behaviors, the CTIC lists stereotyping, deindividuation, mindlessness (i.e., a lack of intercultural awareness), depersonalization, and projection. Related dissociative encoding behaviors include divergence, increasing communicative distance, shibboleth schema (i.e., language-based forms of discrimination and power dominance aimed at nonnative speakers), ethnophaulism (e.g., racial and ethnic slurs), and hate speech. All forms of dissociative communication are expected to be positively correlated with environmental stress, and potentially present during interethnic encounters.

One of the unique aspects of CTIC is how it combines psychological, sociological, and anthropological conceptualizations of ethnicity, fusing them together into a "communicative" approach by emphasizing the critical role of shifting social and physical contexts. The model predicts interethnic behavior at the intrapersonal, interpersonal, intra-/intergroup, and environmental contextual levels—what Kim refers to as "layers."

Support for the CTIC can be found in experimental TMT research exploring preference for one's own nationality and derogation of dissimilar others. For example, Bassett and Connelly (2011) found that, after reading a passage attributed to either a Mexican or Canadian immigrant, American students within the MS condition evaluated the Mexican immigrant more negatively

than the Canadian students, and found them more threatening. Similarly, (Oschmann and Mathy 1994, as cited in Greenberg et al., 1997) found exposure to MS caused German students to express dissociative nonverbal behavior toward a foreigner, as students in the MS condition displayed associative behavior by moving physically closer to a German confederate, but dissociative behavior by moving further away from a Turkish confederate. Greenberg et al. (1997) note how this is a particularly compelling finding given that it demonstrates actual behavior—both associative and dissociative—and not merely an attitudinal expression.

Along related lines, MS has been found to influence *intra*-ethnic dissociative behavior as well. For example, Arndt, Greenberg, Schimel, Pyszczynski, and Solomon (2002) found a negative ethnicity prime (i.e., having Hispanic participants read a negative vs positive story about Hispanic people) combined with MS motivated the derogation of in-group members (i.e., participants provided a more negative evaluation of art attributed to a Hispanic artist) as a means of distancing the self from negative identifications—presumably, to bolster self-esteem.

Landau, Johns, & Greenberg, et al. (2004) found terrorism salience to function similarly to MS in generating concerns about mortality, noting how news of terrorist attacks can increase people's support for national leaders using firm, reassuring but polarizingly simple forms of dichotomizing rhetoric (e.g., "you're either with us or with the terrorists"). Given the connection between environmental stress and in-group favoritism versus out-group discrimination, it is not unlikely that MS should increase environmental stress, interethnic hostility, and consequent dissociative communication behaviors. Moreover, because the essential components of ethnic identity, such as racial makeup and ancestral heritage, cannot be modified in the same sense as more culturally adaptive cognitive processes, interethnic discord likely represents a more intractable source of existential anxiety, which may resist more benign forms of worldview bolstering.

Considering how interethnic conflicts tend to be more persistent and more prevalent than traditional interstate wars (Ellis, 2005), and seeing how traditional borders have begun to fluctuate as technology advances and mobility increases, diverse ethnic groups that have traditionally been more isolated have recently begun coming into more frequent contact, sparking more conflicts across the globe. In light of the increasing refugee crises noted earlier, such conflicts are likely to intensify in a process Cleveland (2012) refers to as a "trilemma," or "the mutually damaging collision of individual human rights, cultural human diversity, and global human opportunities" (p. 431).

Unfortunately, in the face of interethnic division and conflict, reinforcing one's symbolic meaning-making system may be both more difficult and simultaneously less structurally effective at reducing existential anxiety and its myriad negative outcomes. Intercultural and interethnic research in this

area, along with related TMT research, indicates that when environmental stresses increase, and mortality is made salient by world events, added strain is placed on ethnic group boundaries, leading to dissociative behaviors both between, and within, ethnic groups. However, TMT experiments may not always clearly distinguish between ethnicity and culture. A potentially useful future research direction might focus on further clarifying and distinguishing between the effects of ethnicity versus culture, and how such differences may relate to people's attempts to buffer existential anxiety. Numerous TMT studies have demonstrated derogation of culturally dissimilar others by asking participants to rate the author of an anti- versus pro-American essay attributed to either a similar or dissimilar other. Generally, the essay author is characterized as a foreign international student. Although such an essay-rating paradigm may provide a reliable method of evaluating out-group members, it may nonetheless confound culture with ethnicity.

Exploring the relationship between culture and ethnicity, and their relative effects on communication behavior, McKay-Semmler and Kim (2014) found that ethnic minority youth with greater host intercultural communication competence were better able to integrate into US public schools, as well as demonstrate more effective interpersonal communication. Furthermore, intercultural communication competence was found to predict greater psychological health. This is an interesting finding, since the ethnic group under investigation—Hispanic youth—generally reports stronger ethnic, in-group identity strength (i.e., greater capacity to influence the surrounding host environment at large) relative to other minority populations. McKay-Semmler and Kim (2014) also found individual differences in host intercultural communication competence predict motivation to decrease dissociative forms of communication, and increase engagement with dissimilar others. On the other hand, host group-level traits, such as strong ethnic identity and in-group preference, played less of a role. Nuanced findings such as these, concerning both ethnic minority attributes along with host attributes, could add to the richness and complexity of TMT research exploring the effects of MS on the treatment of dissimilar others.

Allport (1954) viewed in-group preference as a psychologically fundamental aspect of human nature, and although strong ethnic discrimination can lead to resentment and hostility, in-group biases may be ameliorated by the formation of a value system encouraging positive feelings toward out-group members, such as charity, tolerance, and respect. Such values—what Allport referred to as "world-loyalty" (1954, p. 44)—need not be incompatible with national patriotism and pride of country. More recently, greater in-group/out-group harmony has been demonstrated by varying the circumstances of interaction and cooperation, and encouraging the formation of new schemas for conceiving out-group members more like in-group members (Brewer & Miller, 1984; De Figueiredo, de Figueiredo, & Elkins, 2003).

Terror management research has focused on the different modes of distal defense people use to alleviate existential anxiety, such as protecting one's CWV, self-esteem bolstering, distancing from the body, and investing in intimate relationships; and it has also shown how individual personality differences can play an important role in moderating MS effects. For example, Landau, Johns, & Greenberg, et al. (2004) demonstrated how personal need for structure (PNS; Neuberg, Judice, & West, 1997; Neuberg & Newsom, 1993) can play a key role in how people experience existential anxiety. Noting how we are motivated to structure social information by applying heuristics and stereotypes to form cognitive shortcuts (see Chapter 5, this volume), Landau (2004) showed how such modes of thinking can function to systematically favor one's own CWV over a dissimilar other's. In a series of studies, Landau, Johns, & Greenberg, et al. (2004) found MS led those high in PNS to increase their preference for consistent, simple, stereotypic views of others, and their social relationships. On the other hand, those low in PNS do not show such tendencies when their mortality is made salient, but rather tend to become more flexible and open to nonstereotypical ways of thinking (Vess, Routledge, Landau, & Arndt, 2009). Another consideration then, regarding a means for reducing dissociative encoding and the effects of negative stereotypes, would involve encouraging less simplistic ways of viewing out-group members when structuring one's social world. Flexibility in thinking should support the use of associative rather than dissociative forms of communication.

VESTED INTEREST

What other individual differences are likely to moderate the effects of existential anxiety, and how might we identify those attitudes individuals hold that are best able to predict behavior during times of heightened environmental stress? Since Allport's (1935) initial exploration of the attitude construct, attitude researchers have looked at a broad range of factors influencing the attitude–behavior relationship (e.g., attitude strength, conviction, importance, and ego-involvement; see Petty & Krosnick, 1995). However, because attitude–behavior consistency is both limited and conditional, identifying those attitudes that are most reliably predictive of behavior may not always be straightforward. For instance, although people may report having positive attitudes about the importance of tolerance and intercultural harmony, their actual behavior may be predicted better by their attitudes about race, ethnicity, politics, and religion. In this regard, attitudes that appear to be relevant in one context may bear little or no relationship with the behaviors observed within that context. One predictor of attitude–behavior consistency, perhaps more effective than either attitude strength or attitude importance, is vested interest (VI) (Crano, 1983).

Focusing on the most hedonically relevant variables moderating the relationship between attitudes and behavior, Crano and colleagues have developed VI theory, and demonstrated its reliability in predicting attitude–behavior consistency (Crano, 1983; Crano & Prislin, 1995; Lehman & Crano, 2002). Five components of vestedness have been identified as reliable predictors of behavior: stake, salience, certainty, immediacy, and self-efficacy. Drawing from the extended parallel process model (EPPM) of fear appeals (Witte, 1992), Miller, Adame, and Moore (2013) have added a sixth variable, response efficacy, to the VI framework, and applied the expanded VI model to designing more effective disaster (i.e., tornado and earthquake) preparedness messages. Although VI theory considers stake to be one of the five components of VI, Miller et al. (2013) view stake more as the primary dimension with which the other components interact to create higher levels of vestedness. In brief, the essential elements of VI can be characterized as follows:

Stake. An attitude holder's investment in a given attitude object is represented by his or her basic subjective perception of the personal gain versus loss consequence associated with that object. The greater the magnitude and duration of consequences, the greater the stake, and the higher the likelihood of attitude-consistent behavior. Per TMT, certain attitudes and beliefs form the essential structure of more complex values imbedded in one's CWV, which provides the basis for reducing the anxiety associated with personal vulnerability and death. Thus, the attitudes most directly associated with one's CWV are likely to be considered high in stake.

Salience. How pronounced, intrusive, or noticeable an attitude object is effects its salience. Crano and Prislin (1995) have shown how accessibility priming can increase vestedness, which has the effect of enhancing the salience of the perceived hedonic consequences of an attitude object. As TMT research has shown, death salience is highly reliable at predicting a wide range of proximal and distal defensive behaviors.

Certainty. The confidence and conviction individuals attach to the gain/loss consequences of an attitude object affect perceptions of certainty. If the hedonic consequences are uncertain, a relevant attitude is unlikely to be highly vested. People may express varying degrees of uncertainty about the possibilities of a death threatening situation, however no one is uncertain about the ultimate inevitability of one's death. From a TMT perspective, the perceived certainty of consequences associated with death provides a powerful influence on attitude-behavior consistency.

Immediacy. VI theory posits that the hedonic relevance of an object whose consequences are removed in time will be less substantial than one whose consequences are perceived as more immediate. When death is not salient, a lack of immediacy helps explain many self-destructive

behaviors, such as smoking, drug use, and poor nutrition. People's attitude about death may be extreme and negative; however, if they think of death as residing in the distant future, their positive attitudes about the pleasures of smoking, drug use, and sugary foods will be more predictive of behavior than their attitudes about death and dying.

Self-efficacy. A fifth component of VI, self-efficacy, involves people's perceptions of their ability to perform actions consistent with the gain/loss consequences of the attitude object. If the relevant actions are perceived as beyond one's capability, self-efficacy will be low, weakening vestedness and attitude–behavior consistency. There is a large literature showing how one's self-perceived ability to enact an attitude-implicated behavior has a powerful influence on one's willingness to act beyond their actual ability to do so (Bandura, 1982).

Response efficacy. A final component of VI, drawn from the EPPM (Witte, 1992), response efficacy, represents one's perception of the potential effectiveness of a recommended behavior. There are key distinctions between response efficacy (whether an action is effective) and self-efficacy (whether one perceives an ability to perform the action), although the concepts are closely related (Miller et al., 2013). For example, individual may perceive themselves as entirely capable of learning from and participating in diversity training (i.e., possessing high perceived self-efficacy), yet lack confidence in its effectiveness (i.e., perceiving a low level of response efficacy), and thus lack the motivation to attempt it.

From a TMT perspective, these components of vestedness would suggest the consequences of self-efficacy and response efficacy are related to effectance motivation (White, 1959), or what Greenberg, Pyszczynski, and Solomon (1995) refer to as self-expansive, growth-oriented motives. Although people's long-term survivability depends on their inclination toward such exploration and growth-oriented behaviors, relative to other more imminent concerns, these aspects of survival may not be felt as a pressing response to more immediate threats from the environment; thus, they may unfortunately be perceived as less vested, and therefore, not particularly urgent for most people.

CONCLUSION

Cohen, Solomon, & Kaplin (2017) recently found evidence that asking people to think about immigrants can stimulate thoughts of death. The implications of this within the domains of politics, social influence, and interethnic communication are particularly troublesome. Along similar lines, Cohen, Solomon, Maxfield, Pyszczynski, and Greenberg (2004) demonstrated how

MS can enhance the appeal of charismatic leaders over those portrayed as task- or relationship-oriented. Landau, Arndt, & Solomon, et al. (2004) found MS increased support for President George W. Bush in his role as Commander in Chief, revealing how terrorism salience, in the form of reminders of 9/11, can have the same effect as MS on support for the President. Moreover, there is evidence this effect may also have applied to support for Donald Trump in the 2016 election, when he was successful at projecting an authoritarian image of rigid nationalism, and what some have characterized as dissociative examples of ethnic prejudice (Cohen et al., 2017). As Landau, Arndt, & Solomon, et al. (2004) have noted, applying ethnic stereotypes can serve a CWV bolstering function for people high in PNS, so it should not be surprising that nationalistic leaders appealing to simple, rigid, heuristic ways of thinking should enjoy wide popularity by a sizable portion of the population.

On the other hand, simple civility may be the key to modifying negative ethnic stereotypes and achieving integration and cultural harmony within a society. According to intergroup contact theory (Allport, 1954), under the right conditions—when opportunities to freely interact and communicate are encouraged—interpersonal contact is one of the most effective ways to reduce prejudice between majority and minority group members. Greater understanding develops when people engage in associative behaviors with differing others. Moreover, merely providing in-group members with knowledge that other in-group members have out-group friends can also foster more positive attitudes toward out-group members (Wright, Aron, McLaughlin-Volpe, & Ropp, 1997), breaking down social and cultural barriers.

Future research at the interface of cross-cultural and interethnic communication and TMT can shed more light on the various interactions—both associative and dissociative—people have in response to news of terrorism, war, interethnic conflict, immigration, and a range of foreign policy issues and current events many people find distressing and threatening. At the same time, a focus on more self-expansive, organizing, integrative, complex, and introspective ways of thinking and behaving could encourage increased growth-oriented, intrinsically motivating ways of engaging others, thereby reducing environmental stress, intercultural discord, and the potential for existential anxiety.[2]

2. In response to the phrase, "*Everything happens for a reason*," the late journalist and true crime writer, Michelle McNamara insisted, "*No it f—ing doesn't. It's chaos. It's all random, it's horrifying and if you want to try and reduce the horror and reduce the chaos, be kind, that's all you can do, be kind.*"

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Handbook of TERROR MANAGEMENT THEORY

Edited by
Clay Routledge and Matthew Vess

Handbook of Terror Management Theory provides an overview of Terror Management Theory (TMT), including the critical research derived from the theory, recent research that has expanded and refined the theory, and the many ways that the theory has been utilized to understand domains of human social life. The book uses TMT as a lens to help understand human relationships to nature, cultural worldviews, the self, time, the body, attachment, group identification, religion and faith, creativity, personal growth, and the brain.

The first section reviews theoretical and methodological issues, the second focuses on basic research showing how TMT enhances our understanding of a wide range of phenomena, and the third section, Applications, uses TMT to solve a variety of real world problems across different disciplines and contexts, including health behavior, aging, psychopathology, terrorism, consumerism, the legal system, art and media, risk-taking, and communication theory.

KEY FEATURES

- Examines the three critical hypotheses behind Terror Management Theory (TMT)
- Distinguishes proximal and distal responses to death-thoughts
- Provides a practical toolbox for conducting TMT research
- Covers the Terror Management Health Model
- Discusses the neuroscience of fear and anxiety
- Identifies how fear motivates consumer behavior
- Relates fear of death to psychopathologies





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